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ABSTRACT

An evaluation was conducted to describe Tech Prep prototypes as they have been implemented in five sites in Indiana and to determine the effectiveness of the programs. Tech Prep is a curriculum initiative that: is performance based, provides students with skills necessary to gain employment or to pursue further education upon high school graduation, relates to a broad scope of occupations, includes academic skills taught through practical application, and allows for credit in high school and college and cooperative arrangements. Information was collected through site visits; document review; review of course materials; interviews with students, teachers, counselors, and administrators; and classroom observation. Results of the survey provided a description of the Tech Prep program as implemented at the five sites. The study concluded that each pilot program is well managed and staffed by enthusiastic teachers. It also found that all sites have done a good job of planning, developing, and implementing the pilot activities. No one curriculum model emerged as best; each had strengths and weaknesses and focused on specific needs of the communities and students in its area. Tech Prep has not been labeled a science, mathematics, or vocational program in any of the sites--this is viewed as a positive result that will facilitate dissemination. Recommendations were made for improving and expanding the Tech Prep program. (Appendix includes questionnaires.) (KC)

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Evaluation Report

Technology Preparation Pilot Test
School Year 1989-1990

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The Indiana Department of Education

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Evaluation Consultants
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July, 1990

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Introduction

Tech Prep is a legislatively mandated initiative in Indiana. Its purpose is to help high school age students prepare themselves for advancement within the technologically oriented work force. Essentially, the Tech Prep initiative required the curriculum to:

- be performance based;
- provide students with skills necessary to gain employment or to pursue further education upon graduation;
- relate to a broad scope of occupational opportunities;
- include math, science, and English/language arts courses, taught through practical application and designed to meet graduation requirements for those subjects;
- be designed to include secondary and post secondary sequence models; and
- allow for dual credit, advanced study, and cooperative arrangements.

Purpose of the Evaluation

The purpose of this evaluation is to provide a description of prototypes as they are implemented in five different sites and to evaluate the effectiveness of the prototypes and their components. Stipulations included in the legislation (PL-217-87) provided a framework for the development of a number of key questions identified by the Technology Preparation Task Force and Evaluation Consultants.

1. Is the target population being served?

2. Is progress being made toward achieving the program goals?

3. Is the curriculum performance based?

4. Are the science, math, and language arts courses being taught through practical application?

5. Are the student outcomes, in terms of competencies, the same as those for courses taught in the traditional manner?

6. How do local business, industry and labor groups perceive Tech Prep?

7. How do post secondary personnel view Tech Prep?

8. What has been the impact of Tech Prep on school climate?

8. What has been the impact of Tech Prep on school climate?

9. What changes have occurred in students' attendance, attitudes, career maturity, and grade point averages as a result of the program?

10. What features of the prototypes facilitate replication?

11. What are the barriers to implementing Tech Prep?

12. What resources are necessary to implementing the prototypes in other settings?

Evaluation Procedures

Within this framework, information was collected in a variety of ways. During three separate visits to each site during the 1989-90 school year; the evaluation team reviewed documents associated with Tech Prep program planning and implementation, reviewed course materials, interviewed students, teachers, counselors and administrators and observed classroom instruction.

In addition, area employers, faculty not directly involved with the Tech Prep program, and key individuals from post secondary institutions were surveyed to gain their perspectives on Tech Prep. Results of these surveys are included in this evaluation report. Pre and post program data were also collected to assess changes in students' attendance, attitudes, career maturity and grades as a result of the program.

Results

Results reported in this evaluation report are presented in five sections. First, descriptions of the Tech Prep prototypes as they are implemented in the different sites are presented. Summaries of pretest student data are included in each description.

Second is a summary of student gains that have resulted from Tech Prep activities. Third is a section that presents the summary of three surveys that were conducted. The fourth section includes a list of conclusions which are drawn across all five sites. Fifth, suggestions are presented which are directed toward the Task Force and the Department of Education rather than the individual sites.

Prototype Description

Monroe County Community School Corporation
Bloomington, Indiana

Program Description

Setting

Monroe County, located in south central Indiana, has an estimated population of 100,000 people with approximately 53,000 living in the city of Bloomington. The growth rate has shown a slight increase over the past five years. The Bloomington area is experiencing a strong and expanding economy with an unemployment rate slightly above 3% The area's economy is varied with a strong manufacturing base and many service related industries.

The employment sector of Monroe County is split into three major categories: Industrial/Manufacturing, Indiana University, and Limestone. Indiana University is the largest employer of the community, accounting for over 6800 jobs. The industrial base of the community is spread across a number of large and small firms including: RCA/Thomson, General Electric, Cook, Inc., Otis Elevator, Westinghouse, Wetterau Foods, B.F. Goodrich, Schlegel Corporation, and others. The limestone business represents world participation in the limestone supply. A number of businesses are involved in quarrying, cutting, and carving limestone for the residential, commercial and governmental use. These businesses include: Bybee Stone, C&H Stone, Fluck Stone, B.G. Hoadley Quarries, Independent Limestones, Midland Cut Stone, and others.

A recent economic development study conducted by an external party identified the following strengths and weaknesses of the community for attracting and maintaining new business:

Strengths

- availability of clerical labor
- attractive clerical labor costs
- electric power cost and availability
- favorable state business climate
- higher education facilities
- cultural/recreation activities, and
- community appearance

Weaknesses

- shortage of skilled manufacturing labor
- condition of local industrial road access

- relative high cost and shortage of fully developed sites, and
- absence of industrial buildings for sale.

This study presents a picture that could be favorable to growth in the community and it highlights the importance of a well prepared citizenry.

Monroe County has a varied school population, with segments from blue collar, university related, and management related families. The County has two four year high schools. Bloomington North High School has an enrollment of approximately 1250 students. It is a comprehensive high school with a separate area vocational center serving additional high schools in the area. Bloomington South is the older of the two and is also a comprehensive high school with an enrollment of approximately 1550 students.

Management and Committee Structure

The Vocational Director is responsible for administering the project since the funds come through the vocational channels. The project manager, in cooperation with the Bloomington North and South High School principals coordinates the overall activities related to classroom instruction and implementation with teacher evaluation remaining the responsibility of the individual high school principals. The project manager is responsible for communication with and directing all activities involving the project team. The manager is also responsible for articulating the Tech Prep activities horizontally between the curriculum teams and vertically between the secondary and the post secondary institutions.

The project manager also orchestrates all staff development activities, continued curriculum development activities, and is the chief contact for the Department of Education.

Program Goals and Objectives

The Technology Preparation curricula within the Monroe County Community School Corporation pilot program is focused on achieving the following goals:

Goals

- Technological literacy for all general education students.
- Increase student motivation and achievement in basic skills areas through applied courses in science, mathematics and language arts.
- Integrate the curriculum the curriculum to better reflect the ways that knowledge and information are processed in our modern technological society.

- Increase the number of students attending post-secondary technical colleges and universities.
- Increase the number of students ready to enter the world of work through the development of life long learning skills.

Curriculum

The Tech Prep curriculum in Bloomington differs from those implemented in other sites in several ways. First as mentioned earlier, the curriculum begins at the ninth grade. Philosophically, the site personnel have concluded through considerable input from the private sector, that starting in the eleventh grade does not provide sufficient opportunity to build the base that is necessary for dealing with future technology. Further, it appears that they believe the general education student is too far along in the eleventh grade to turn around to the degree necessary and desireable.

A second difference in the Bloomington Tech Prep curriculum is that it is not being sold as a new and separate program. Rather, it is being portrayed as a strategy for possible inclusion into a redefined and reconstituted curriculum for the entire school(s).

A third difference, though not as extreme a difference as the first two, is the emphasis being placed on teacher staff development in Bloomington. This effort is based upon the belief that a change such as one promoted through Tech Prep requires a great deal of change in teacher attitude and skill. Consequently, changes in teaching and planning for teaching are being facilitated through several innovative staff development activities.

The curriculum for year one and year two is summarized as follows:

Year 1

Physical Science (applied)

Introductory Algebra 1-2 (applied)

Language Arts 1-2 (applied)

(Tech Prep electives include Keyboarding, Computer Applications and Introduction to Business).

Year 2

Biology 1-2 (applied)

Introduction to Algebra 3-4 (applied)

Language Arts 3-4 (applied)

(Tech Prep electives include Computer Applications/Computer Graphics and Introduction to Business).

During Year 2 of the pilot program, a major change will occur through the implementation of Introduction to Algebra 3-4, Biology 1, and Language Arts 3-4. During year 2 the lead teachers will develop and implement the curriculum. Other teachers will use some of the materials, but it will most likely be the following year before across the board implementation is achieved.. This is different from selecting one group of students and targeting them for Tech Prep. Instead, it focusses on all, or at least a large portion of those in the general education curriculum. The administration of the schools and the Tech Prep manager believe this is a more effective and efficient way to meet the needs of students and to achieve the intent of the Tech Prep law.

Students

The Monroe County Community School Corporation's Tech Prep pilot program differed from the other four pilot programs in terms of program design. This difference can be summarized by saying that Tech Prep begins at the 9th grade level rather than the 11th grade level. This difference is described in greater depth in a later section. Since 9th graders were the target for year one, it was necessary to recruit students from Batchelor and Tri-North Middle schools.

The Tech Prep manager made visits to both middle schools and met with teachers, counselors and administrators. The middle school counselors made an initial screening of students who were bound for introductory algebra. The Tech Prep manager in cooperation with high school counselors, sent letters to parents and phone calls followed. Any student from Introductory Algebra who wanted to be in Tech Prep was also taken. It appears that the basic criterion for selection was 8th graders intent to enroll in introductory algebra, which translates generally into the general education curriculum. The secondary criterion appears to be self expressed interest by the students.

A total of 27 students at North High School and 24 students at South high school have participated during the 1989-90 school year. There are more boys than girls enrolled in Tech Prep at each high school (22 and 5 at North and 19 and 5 at South). Teachers of the Tech Prep students at each school identify them as general education students, many whom have problems or are thought of as at risk students. Most teachers also view the students as slightly less mature than other 9th grade students they currently have in class.

There has been only slight attrition from the Tech Prep program over the school year with one student changing schools and another transferring into a regular algebra class. One student was removed as a behavior problem.

Statistical Portrayal of Tech Prep Students and Students from an Equivalent Control Group

As part of the evaluation a great deal of information was collected regarding the students of the program. This data collection was designed to provide a baseline against which performance of the Tech Prep curriculum can be judged. These data provide a description of the Tech Prep students at each school.

In October and November Tech Prep and control group data were collected by accessing files and school data bases and by administering several instruments to the students. The following data elements were acquired: General Achievement data, Grade Point Average, Attendance Record, Course review for the previous year, Career Maturity and Attitude toward a number of school and technology related factors. The following table presents a summary of Tech Prep students at each of the two high schools in the Monroe County Community School Corporation.

Pretest Data Summary for Tech Prep Students

Bloomington South High School
Tech Prep Group
(n = 22)

	MEAN	Std Dev
ISTEP Achievement (8th Grade)		
Math	49.70	25.72
Reading	55.05	22.71
Language	37.25	20.16
# Days Absent 1988-89	12.20	13.01
Grade Point Average (end of 1988-89)	1.96	.70
Gender		
Male	19	
Female	3	
Career Maturity	48.73	9.96
Attitude Toward:		
Teachers	65.51	14.21
Courses	59.03	10.84
School(Gen.)	64.60	9.85
Schedule	71.09	9.44
Further Ed.	69.71	11.57
Technological Careers	69.28	14.53
Technology	52.41	10.84

Pretest Data Summary for Tech Prep Students

Bloomington North High School
Tech Prep Group
(n = 25)

	MEAN	Std Dev
ISTEP Achievement (8th Grade)		
Math	49.92	17.31
Reading	52.40	21.87
Language	47.72	21.45
# Days Absent 1988-89	5.96	5.11
Grade Point Average (end of 1988-89)	2.13	.41
Gender		
Male	20	
Female	5	
Career Maturity	47.84	8.34
Attitude Toward:		
Teachers	61.60	14.09
Courses	67.33	13.14
School(Gen.)	74.18	13.00
Schedule	49.81	13.37
Further Ed.	74.32	9.29
Technological Careers	75.97	11.46
Technology	68.86	8.92

Faculty

Six teachers were directly involved in the delivery of Tech Prep during the 1989-90 pilot year. During the Summer months, teachers were given the opportunity to work together, e.g., math teacher from North and math teacher from South with another person providing assistance. The Summer experience was devoted to the design of the curriculum, formulation of lesson plans, and making final plans on equipment and materials orders. Also, an intensive staff development activity was provided for all Tech Prep staff during the Summer.

The faculty were identified and recruited by the Tech Prep manager working through the assistant principals and department chair persons at each school. Several teachers felt like they were simply "assigned" while most felt they had volunteered and were interested in participating in the program. The faculty for the most part are very experienced teachers with the average of 19.6 years of teaching experience. The range was from 4 to 34 years.

The Tech Prep teachers are generally enthusiastic about Tech Prep and its potential. Even though all realize its extra demands on their time for planning, preparation, equipment set-up, and meetings, the faculty are committed to the concept and strategies of Tech Prep. A common preparation period is provided for the involved faculty (over and above their regular prep period). This common prep period has paid high dividends at North has paid high dividends in terms of facilitating the integration and coordination of content.

Seven faculty are in the process of developing courses in biology, Introductory Algebra 3-4 and Language Arts 3-4. Additionally, the English Department has undertaken the task of enhancing the entire language arts curriculum, using the concepts and strategies of Tech Prep. It is estimated that over 20 teachers are involved in this task.

Bruce Ricklin provides leadership for the Bloomington Tech Prep program in his capacity as Project Manager. Bruce also devotes part of his professional time teaching (non-Tech Prep) within the Hoosier Hills Area Vocational Center. Following is a list of the teachers and the Tech Prep courses they taught during the first pilot year:

North High School

Bill Frohliger	Introductory Algebra 1-2
Elliot Koyonagi	Physical Science
Sherry Selph-Judah	Language Arts 1-2

South High School

Richard Engle	Introductory Algebra 1-2
Jody Duncan	Physical Science
Phyllis Clapacs	Language Arts 1-2

Facilities and Equipment

Existing laboratory and classroom facilities at both high schools were available and well suited for modification for Tech Prep instruction. The major task was to rearrange a storage room in the science area to accommodate a laboratory for physical science at North. A large classroom was equipped with computers and equipment at South for Physical Science.

Of the $500,000 Tech Prep budget, approximately 80% was spent on equipment and supplies. The vast majority was spent on equipping the physical science laboratories at the two schools and setting up computer labs for language arts and business/mathematics. The remainder of the budget was spent on personnel, travel, and inservice expenses. The majority of equipment expenditures went for computer equipment and software with a much smaller amount going for supplies.

Development Activities

Teachers selected to teach Tech Prep courses were organized as curriculum development Teams to develop Tech Prep curriculum. Each team included a subject matter person from each school, each from the same area. The developmental work was heavily based on the committee work that had been done during the model development period of the project: 1988-89 school

Each Teacher was required to participate in a 5 day staff development session during the Summer of 1989. This five days was devoted to teaching to learning styles (the 4MAT System) that was developed by Bernice McCarthy and to cooperative learning concepts. The 4MAT system then became the basis for lesson planning and curriculum development work.

During the Summer of 1989, teachers were given the opportunity to work for four weeks with financial support from the project. Most teachers took advantage of this opportunity with many investing much more of their time without compensation.

Prototype Description

North Montgomery Community School Corporation
Linden, Indiana

Program Description

Setting

The North Montgomery Community School Corporation is located in and serves the northern most parts of Montgomery County, Indiana. The county is one of eight counties that make up Ivy Tech--Region IV, Lafayette, Indiana, located in the east central part of the state.

Although the county would typically be considered rural, its economic base would probably be more considered industrial with many residents commuting to Indianapolis, Lafayette and Crawfordsville. Crawfordsville is the population center of the county and has a number of small to medium sized employers including R. R. Donnelley, its largest, employing approximately 2,000 residents.

The North Montgomery Community School Corporation is one of three school corporations in Montgomery County. It has a population of between 22,000 to 25,000 with a K through 12th grade enrollment of approximately 2,000. The corporation has three elementary schools, one middle school, and one high school. The elementary schools have over 900 enrollees in grades K-5. The middle school enrolls approximately 450 6th through 8th graders and the high school enrolls approximately 600 students annually. All of the facilities are relatively new providing adequate space and a good learning environment.

The high school, although opening in 1971, is an attractive, large facility in excellent condition with an atmosphere that reflects a student body, faculty and community who are proud of their school. The students reflect a middle to lower middle class socioeconomic status. The high schools' curriculum would be considered comprehensive even though the school is a small rural one by today's standards. Approximately 40 percent of the school's enrollees are considered college prep with another 10 percent that would matriculate to two-year post secondary trade schools and/or the military. Although the school participates in a vocational cooperative, only a few students are enrolled in a limited number of programs. A number of courses are offered in the school which are vocational in nature or culminate in students entering the work force in related areas.

Management and Committee Structure

Representatives from business and industry, secondary education, and post secondary education were divided into three major groups comprising the organizational structure: the Advisory Committee, the Steering Committee, and the Task Force. The primary task of the Advisory Committee is to present input and advise from the employer perspective. The Steering Committee has the overall responsibility for directing the project, hiring and supervising personnel, handling fiscal matters, and

monitoring the progress of the project. The Task Force, comprised of experienced and presently practicing secondary and post secondary personnel of diverse disciplines, created the curriculum model, designed the curricula, developed the courses, and planned the marketing and piloting strategies and procedures.

The Steering Committee selected a Project Manager who reports to the Committee and serves a liaison role between all three groups in the organizational structure. The Project Manager's primary responsibility is to chair the Task Force (the group that carries on the work of the project).

Program Goals and Objectives

The following goals were identified in the original Region IV proposal but seemed to have been expanded upon as indicated by the goals found in project reports that were submitted to the state in November 1989 and March 1990. Those additional goals are included in this report immediately after the first three identified goals.

- An articulated curriculum design which will prepare students for employment clusters in business occupations, health occupations, or the technologies.
- Delivery systems which can work successfully in various types of secondary schools, from metropolitan to rural.
- A marketing program to promote the concept of Tech Prep curriculum among secondary students who have previously chosen the general curriculum rather than vocational education or the college prep curriculum.
- Articulation agreements with post secondary institutions.
- Student participation in Tech Prep program to increase during the test pilot period.
- Alternative programs will provide students increased opportunities to make appropriate curriculum choices.
- Students completing the Tech Prep curriculum will have enhanced their employability.
- Students completing the Tech Prep curriculum will pursue post secondary education to a higher level of success than those completing a college prep program.

Curriculum

North Montgomery High School during the first pilot year offered primarily three courses that had a concentration of students identified as Tech Prep students. All of the courses were initiated after the start of the 1989-90 school year because of the late approval of the project. Consequently, the students were predominately

business education majors, which was one of the occupational areas identified in the original proposal. North Montgomery High School has the most occupational integrated Tech Prep efforts of the state's pilot sites. In addition to the Business students, there were four to six students identified as Technology/Manufacturing majors.

Following are the courses offered during the first year followed by the proposed second year offering:

First Year

Oral/Written Communications -- first and second semesters

Personal Keyboarding -- first semester

Introduction to Business -- first semester

Interpersonal Relations -- second semester

Computer Applications -- second semester

Second Year (the following additional courses will be offered)

Accounting -- two semesters

Economics -- one semester

Applied Physics -- two semesters

Mathematics Tech Prep -- two semesters

Manufacturing Processes -- One semester

Drafting -- two semesters

Computer Aided Drafting -- two semesters

Business Law -- one semester

Students

A total of 28 students started the Tech Prep pilot of the 30 originally recruited by the counseling staff a week or so prior to the start of the 1989-90 school year. Enrolling students at such a late date was a remarkable accomplishment. There were 26 students in the program at the end of the school year.

During the last week of August 1989, Tech Prep was marketed to junior-level students during their social studies and language arts classes. After 30 students had indicated a willingness to enroll in the Tech Prep classes, letters were sent to the students' parents to confirm the "adds and drops" classes. As a result, 28 students were then considered enrolled as the pilot group. Of the 28, 22 were enrolled in the Business related pilot and 6 were enrolled in the Manufacturing Technologies sequence. The students had been asked to switch from a General Studies curriculum to the Tech Prep courses and were thought to represent the general education track student.

Second year recruitment efforts and preregistration have been completed for the 1990-91 school year with 40 students enrolled. The process used included:

- Sophomore students received an information handout describing the Tech Prep components of Business and Technology.
- A 20 minute presentation concerning Tech Prep was given to sophomore Language Arts and Math classes by selected Tech Prep staff.
- Counseling sessions were scheduled for a review of their (students) four-year academic plan and final course selection for 1990-91.
- Follow-up letters were sent to parents advising them of student alternative programs.

Word of mouth from current Tech Prep students to underclass mates has been attributed to the recruitment of the 40 students registered for next school year.

Statistical Portrayal of Tech Prep Students and Students from an Equivalent Control Group

As part of the evaluation a great deal of information was collected regarding the students of the program. This data collection was designed to provide a baseline against which performance of the Tech Prep curriculum can be judged. These data provide a description of the Tech Prep students at each school.

In October and November Tech Prep and control group data were collected by accessing files and school data bases and by administering several instruments to the students. The following data elements were acquired: General Achievement data, Grade Point Average, Attendance Record, Course review for the previous year, Career Maturity and Attitude toward a number of school and technology related factors. The following table presents a summary of Tech Prep students at North Montgomery High School.

Pretest Data Summary for Tech Prep Students

North Montgomery High School
Tech Prep Group
(n = 29)

	MEAN	Std Dev
CAT Achievement		
Math	57.76	18.15
Reading	46.32	17.16
Language	52.04	19.31
# Days Absent 1988-89	5.15	4.88
Grade Point Average (end of 1988-89)	2.04	.43
Gender		
Male	12	
Female	17	
Career Maturity	45.21	8.22
Attitude Toward:		
Teachers	71.15	8.77
Courses	60.61	6.92
School(Gen.)	63.84	10.89
Schedule	67.93	11.10
Further Ed.	70.69	7.32
Technological Careers	65.52	10.91
Technology	49.55	7.84

Faculty

Eleven teachers have been involved in Tech Prep during the pilot year, although only 2 of the 11 have had a Tech Prep class with a concentration of Tech Prep students. Of the remaining teachers, one other had three of the Tech Prep students in a class with other students. The majority of the teachers, although involved in staff meetings and inservice activities, have been developing curricula for year two of the pilot.

Ted Newell provides leadership for the North Montgomery Tech Prep program in his capacity as Project Manager. Ted is an administrator with the school corporation with an office in the central administration building located in Linden, Indiana. Pam Tetidrick, the high school Business Education chairperson and the teacher of Tech Prep Computer Applications has done a lot of the work with the other teachers as well as with curricular paperwork. All of the Tech Prep staff are licenced in their areas of teaching and, for the most part, seem enthused about the changes being made. Following is a list of the staff and the courses taught this year or that will be offered next year:

Pam Tetidrick--Computer Applications '89-90

Carol Hardy--Interpersonal Relations & Communications '89-90

Cindy Bannon--Intro to Business (three students) '89-90

Ray Seale--Applied Physics '90-91

David Horney--Economics '90-91

Ed Stuffle--Drafting & CAD '90-91

Ken Brewer--Accounting '90-91

Mike Sowers--Manufacturing '90-91

Barry Strong--Math '90-91

Ron Bryand--Math '90-91

Facilities and Equipment

The facilities used during the initial pilot year were those used in previous years for more traditional courses. Each of the classes was taught in a separate classroom and/or lab. There is no common lab or classroom facility designated as a Tech Prep facility.

Although the communications and interpersonal relations courses used videos and a video camera, it was necessary that this equipment be moved from room to room since more than one room was used for these classes. During the second year with the addition of 40 students to the program and several new courses, a number of labs and classrooms will be used for the Tech Prep program. These facilities will be modified with the addition of special equipment and some wall structures in the Technologies area.

Of the original grant ($170,123) $60,000. was budgeted for equipment, primarily to equip the computer applications lab. As of the middle of March 1990, $39,334 had been expended for equipment. The majority of the grant has been used for personnel contractual services.

Development Activities

The late decision in determining the specific site and subsequent project approval severely impaired the development aspects of the project at NMHS that should have taken place as many as three months prior to late August of 1989. The delay resulted in the following problems that the other pilots did not endure (at least not to the same magnitude):

- Teacher selection and involvement a week prior to the start of school.
- A lack of a period of time for an intense, concentrated teacher inservice on the concept and teaching methodology.
- Curricula being developed as they were being taught.
- Extended delays in obtaining equipment.
- Recruiting students from on-going classes.

The second year effort should include an active curriculum committee as well as committees on 1) recruitment and marketing (to assist with public information campaigns); 2) evaluation (to assist in the on-going assessment of the program); 3) articulation (to assist with going beyond awarding of advanced credit); and 4) staff development (to assist in identifying needs and facilitating inservice).

A major intrinsic value of such committee structure would be the numbers of people that would be involved and acquiring some ownership as well as knowledge of the Tech Prep concept.

Prototype Description

Metropolitan School District of Wayne Township
Indianapolis, Indiana

Program Description

Setting

The Metropolitan School District of Wayne Township serves all of the public school needs of Wayne Township. The township constitutes the western boundary of the city of Indianapolis and Marion County, Indiana.

Wayne and the surrounding townships provide a varied and diverse socioeconomic combination of industrial complexes, apartments, condominiums, country clubs, parks, and single family dwellings. Because of its central location, the township enjoys a sound economic base and is populated by mostly middle-class families although its residents include a number of wealthy families as well as some of the poorest city residents.

The district has 11 elementary schools, 3 middle schools which include grade nine, and Ben Davis High School which consists of over 2,700 10th through 12th graders. Unique to Ben Davis is the containment of an area vocational school that serves 10 other districts' high schools. The district has been stable for years but is recently experiencing an enrollment growth that should stabilize in the early nineties.

The close proximity to a large metropolitan area is an added advantage, making possible many cultural opportunities as well as diverse employment opportunities, a majority of which require less than a baccalaureate degree.

The community, although suburban/rural in nature, is fortunate to be provided a vast array of post secondary educational institutions; such as IVY TECH, Indiana University, Purdue University, Butler University and others.

Management and Committee Structure

The Project Manager (employed half time) oversees and coordinates all activities of the Tech Prep Program. The manager is responsible for maintaining written records of the program, disseminating all reports, and developing a monthly newsletter. In addition, the Project Manager coordinates the activities of the Tech Prep committees.

To plan and guide the development, implementation and operation of the pilot year project, a committee structure was established consisting of the following committees; Permanent Planning Committee, Curriculum Committee, Implementation Committee, and Evaluation/Oversight Committee.

Program Goals and Objectives

The proposal and additional correspondence submitted to the state for this pilot listed the following goals to be achieved during implementation:

- To develop specific performance based curriculum modules for technical Science, Technical Math, Technical Communications.
- To develop a specific recruitment process which will target those students who will benefit most from the tech prep program.
- To initiate an in-service training workshop for secondary and post secondary instructors, administrators, and project staff to include awareness of the pilot design and implementation process.
- To implement a marketing/public relations plan which will create public awareness of the Tech Prep curriculum.
- To develop strategies and specific lesson plans for the implementation of a Technology I/II course design to be included in the second year of the pilot.
- To continue curriculum articulation efforts between the secondary and post secondary schools.
- To implement an evaluation plan that will be used in the development of a successful competency based technical curriculum.
- To establish a clear communication linkage between the various pilot site secondary and post secondary faculty and all action committees to ensure that the pilot site tasks are completed and monitored as necessary.
- To pilot the tech prep project at Ben Davis during the 1989-90 school year.
- To develop a second semester tech prep pilot project for Arsenal Tech High School during the Spring semester of 1989-90.
- To increase the number of Ben Davis students who are prepared to enter post secondary education.
- To increase the math, science, and communication skills of students who enter the work force immediately after graduation from Ben Davis High School.
- To enhance student understanding of technical concepts as related to new and emerging technologies.
- To increase problem solving and critical thinking skills of general education students.

- To enable students to set obtainable educational and career goals which will increase secondary retention and completion rates.

Curriculum

The curriculum offered at Ben Davis is based on the concept of better preparing today's secondary student to live and work in an ever advancing technological society. Ben Davis High School offered a curriculum that is the very core of teaching students a Technological Foundation if one accepts the definition of technology as being knowing, thinking, and doing. The first courses consisted of math, science and English and were taught as applied, performance based instruction.

The courses were taught in a three period block of time in a lab that was specifically designed for Tech Prep instruction. Although the three hour block of time was not team taught, it nevertheless facilitated an integration of subject matter. The three hour block also permitted the students to develop a comradery and close relationship with the faculty.

To insure that the instruction was performance based, the faculty developed, with the assistance of the Vocational Director, a performance matrix that charted the students' achievement of competencies. Assistance was sought from local businesses to ensure practical real world application of the instruction.

The curriculum for the first year pilot was as depicted below:

Junior Year--First semester

Tech Prep Mathematics--5 hours per week, 1 credit

Tech Prep Communications--5 hours per week, 1 credit

Tech Prep Science--5 hours per week, 1 credit

Junior Year--Second semester

Tech Prep Mathematics--5 hours per week 1 credit

Tech Prep Communications--5 hours per week, 1 credit

Tech Prep Science--5 hours per week, 1 credit

The second year curriculum will continue with second year math and science for two semesters and Tech Prep Technology will be introduced as a new course for those students continuing into the second year of the program. Tech Prep

Technology will be a two semester course taught for five hours per week for one credit.

Students

Twenty-three students were selected to participate in the first year pilot of the Tech Prep curriculum at Ben Davis High School. The selection process used was to identify a number of students, talk to them and their parents, and solicit voluntary enrollments. The criteria used in the identification were: the completion of biology and algebra prior to the junior year; seemed to be enrolled in a general education program; not enrolled in a vocational program; and interested in a technical career.

The non-college bound counselor identified 50 students meeting the criteria and personally contacted them as well as their parents to solicit their enrollment in the first year pilot. Twenty-three of the students volunteered with 18 continuing through the semester. Three of the original group were dropped from the classes for failing one class; one dropped out of school and the other student transferred out of the district.

The second year recruitment process has commenced with a targeted number being 25 students in the first Tech Prep courses and 18 continuing on into the second year of the core of the math, science and English. The Tech Prep Manager has visited all of the algebra classes and taken the sophomore students to the Tech Prep lab. The students were introduced to the lab, shown a video tape of the project and given an overview of the curriculum and instructional methods being used by the teachers on a daily basis.

Each of the students attending the orientation were given a form to complete if they were interested in the program. Approximately 50 returned the form completed to the Manager. The next step in the recruitment process was to have the Tech Prep counselor interview those expressing interest to select those who may best be served by the project in it's second year of operation. Additionally, a flyer describing the program will be sent to the parents of the prospective students, and they will be personally contacted. In addition to the 25 enrolled for 1990-91, five students will be enrolled as program alternates to replace those who may not show up at the start of school next fall. The students not selected will be used as a control group for continued evaluation efforts in 1990-91.

Statistical Portrayal of Tech Prep Students and Students from an Equivalent Control Group

As part of the evaluation a great deal of information was collected regarding the students of the program. This data collection was designed to provide a baseline against which performance of the Tech Prep curriculum can be judged. These data provide a description of the Tech Prep at Ben Davis High School. In October and November Tech Prep and control group data were collected by

accessing files and school data bases and by administering several instruments to the students. The following data elements were acquired: General Achievement data, Grade Point Average, Attendance Record, Course review for the previous year, Career Maturity and Attitude toward a number of school and technology related factors. The following table presents a summary of Tech Prep students at Ben Davis High School.

Pretest Data Summary for Tech Prep Students

Ben Davis High School
Tech Prep Group
(n = 22)

	MEAN	Std Dev
CAT Achievement		
Math	56.11	15.18
Reading	50.33	15.68
Language	41.06	15.84
# Days Absent 1988-89	12.55	11.36
Grade Point Average (end of 1988-89)	2.13	.38
Gender		
Male	13	
Female	9	
Career Maturity	47.59	8.19
Attitude Toward:		
Teachers	72.24	7.24
Courses	72.59	8.30
School(Gen.)	72.24	9.18
Schedule	58.57	10.02
Further Ed.	70.95	8.54
Technological Careers	74.39	9.93
Technology	67.88	6.49

Faculty

Three teachers were involved in providing direct instruction in the Tech Prep courses during the first pilot year of the program. The three were participants in the development of the prototype for Region 8 and each have a minimum of 10 years teaching experience. An important quality of the staff at Ben Davis is the willingness to change and to remain flexible, constantly working hard and long to improve upon their content as well as their methods. These three teachers volunteered to teach the Tech Prep because of their commitment to the students and belief that not enough was being done for the Tech Prep targeted student.

Tom Corwin provides leadership for the project as the Project Manager as well as serving as the Math Department Chair. Tom was selected as the manager for his commitment and dedication to Ben Davis and its students. His devotion to the concept and strategies was most apparent to the external evaluators. He has an excellent rapport with the school's administration, staff, students and community as well as their respect. Following is a list of the teachers and the Tech Prep courses they taught during the first year of the pilot:

Rick Adcock--Tech Prep Science

Rita Butts--Tech Prep Communications

Ross McKenna--Tech Prep Math

Facilities and Equipment

Staff at Ben Davis were able to establish a Tech Prep laboratory due to the timing of the start of the program and the progress of the construction of an addition onto the high school. The laboratory is the setting for all of the Tech Prep instruction. It consists of a suite of rooms that include not only instructional space but a conference room and a resource/storage room. The lab is exceptionally well equipped with current generation instructional technology that includes visual, mechanical and electrical teaching aids and equipment as well as personal computers. Additionally, the lab is adjoining a computer lab with linkages between the two.

Approximately $220,000 of the first year grant was expended for equipment with one half of those funds going for computer hardware and software. Another $90,000 was used to equip the science course with small amounts going for the communications course. The staff feel that the facility and equipment have been, for the most part, adequate with additional equipment needed for year 2.

Development Activities

Teachers were inserviced as to the development of performance based curriculum and practical application methods of instruction. Additionally the staff:

1. visited the VES library in Bloomington;

2. reviewed the National Consortium developed applied math, applied communications, and principles of technology curriculum;

3. ordered and reviewed materials from CORD;

4. visited the instructional technology center at Ball State University;

5. visited the IBM computer technology center in Indianapolis;

6. visited several businesses and industries to observe application; and

7. met with several sales representatives to preview software and hardware applicable to the teaching of Tech Prep.

Development of the three individual curricula was completed by subcommittees of the overall Curriculum Committee. These subcommittees consisted of the Tech Prep teachers, vocational instructors, and post secondary teachers.

Prototype Description

Indiana Vocational Technical College North Central
School City of Mishawaka
Mishawaka, Indiana

Program Description

The Setting

The School City of Mishawaka, Indiana is located in the Northern Indiana city of Mishawaka which is a twin city to South Bend, Indiana. Ivy Tech--North Central, the post secondary vocational education college, is located approximately 12 miles from MHS. The location is a seamless urbanized area with a projected population of nearly 245,000.

From 1970 to 1987, the South Bend--Mishawaka MSA changed from an economy dominated by manufacturing to a service-based economy. Manufacturing jobs fell from 37 percent to 22 percent. Service related employment rose from 58 percent to 71 percent. The number of jobs in health services totaled 9,300 in April, 1987, making health the area's largest service industry. Similar dynamic changes are occurring in other occupations particularly in the more sophisticated technological manufacturing and business fields.

Mishawaka High School is a comprehensive modern day educational institution with grades 9 through 12 that enrolls approximately 1,600 secondary students. The high school is an extraordinary facility that is well maintained. The pleasant attitude of both students and staff provides for an excellent learning atmosphere. The community should take great pride in its high school both from the standpoint of an exceptional facility and a dedicated, student oriented staff.

Management and Committee Structure

The Tech Prep project at Mishawaka is managed by Diane Chaddock who is a staff member of the IVTC North Central. She devotes approximately half time to the position of manager (even though her actual time commitment appears to be greater than that). The manager is assisted by a Tech Prep counselor who handles student services as well as marketing responsibilities.

Program Goals

The goals as developed during the planning phase and as submitted in the proposal for the pilot year are as follows:

- Design an articulated curricular model beginning in high school and continuing through two years or more of college which provides logical exit and entrance options for students.

- Develop a new curricular option that is performance based and uses applied teaching strategies to prepare students for a broad spectrum of career opportunities.
- Identify a common core of competencies required in allied health occupations, that can be periodically updated to meet new or emerging needs.
- Develop a comprehensive marketing and career guidance program, starting in the lower grades, and inform students, parents, community groups and the general public about the Tech Prep program.
- Develop an in-service training and development plan for secondary and post secondary faculty, counselors and administrators to ensure that the tech prep curriculum is implemented as successfully as possible.

Curriculum

Mishawaka's first year curriculum reflects a core or foundation for the understanding of technology. The courses taught during the pilot year incorporated applied, performance based instruction. The developmental stage included the input of staff from both the secondary and post secondary levels of education. Also, the curriculum is based on the competencies needed in Health, Business, and Engineering occupations.

The courses were taught in laboratories that were modified to be more conducive to Tech Prep concepts and strategies. The classes were one period per day for five days per week. To ensure performance based instruction, students were measured for the competencies that were presented and practiced. Minimum achievement levels were established that each student was to achieve prior to advancing to the next level or unit of instruction. Some interdisciplinary instruction was provided, but it was limited by the staff not having a common planning period, a single lab, or an intact cohort of students. The cooperative learning method was used in some classes that lent themselves to that method.

The first year curriculum is depicted below:

Computer Applications--One Semester, 5 hours per week, 1 credit

Physical Science I & II--Two Semesters, 5 hours per wk., 1 credit

Communications I & II--Two Semesters, 5 hours per wk., 1 credit

Math for Technology--One Semester, 5 hours per wk., 1 credit

Principles of Technology--Two Semesters, 5 hours per wk., 1 credit

The second year curriculum will be a continuation of the Principles of Technology I & II and will include the second year or III & IV. Computer Applications will again be offered as a semester course, but the math course will be expanded to include a second semester. The Communications course will again be offered as will the Physical Science course.

New courses have bene developed and others revised, especially in the occupational related areas of Engineering/Manufacturing Technologies and Business Technologies. A new course for freshman will be implemented as part of the core and will be known as Student Success Skills. This course is designed to introduce students to reading/writing skills as well as organizational skills and will be taught in an applied manner.

Students

Forty-five students constituted the Tech Prep pilot year "student body." The students can be classified as being from the "general education" track. Approximately 80 percent of the students, who are predominately juniors, are not enrolled in a college prep program nor in a vocational course of study.

It is important to note that the students are enthusiastic about their Tech Prep curriculum. This enthusiasm spread so much among their friends during the first semester that the Tech Prep Computer Applications course was demanded by other students in the second semester and is currently offered with five sections of approximately 24 students per section.

The selection process for the initial group of students was greatly hampered by the lateness in receiving the grant approval. The Guidance Department was responsible for identifying , interviewing, and selecting the students, Fortunately, the counselors administered a survey prior to the close of school in 1988-89. From the survey they were able to identify students that indicated some interest in the program. Student and parent contacts had to be made in the summer months at which time they were given information concerning the details of the curriculum and the intended goals of the pilot. Volunteer student participants were then selected on the basis of career goals, educational objectives, and mid-range academic ability. Of the 45 students, 35 were general education, 6 were college prep and 4 were vocational.

The second year recruitment and selection process has commenced with a target number of between 20 and 24 students per course set for the 1990-91 school year. The major focus will be to enroll students in the Tech Prep core of math, science, communications, computer applications, and first year Principle of Technology since the second year class , Principles of Technology, will consist of the first year students. The Tech Prep technology specific courses are primarily courses which have been revised to include the teaching strategies, and already have enrolled

their students. Whenever possible, students will be enrolled in an entire Tech Prep track as opposed to one individual courses such as was necessary this past year.

The same criteria will be used as was used last year in selecting the students for the core courses: general education, mid-range ability, and technical career goals.

Statistical Portrayal of Tech Prep Students and Students from an Equivalent Control Group

As part of the evaluation a great deal of information was collected regarding the students of the program. This data collection was designed to provide a baseline against which performance of the Tech Prep curriculum can be judged. These data provide a description of the Tech Prep students at Mishawaka High School.

In October and November Tech Prep and control group data were collected by accessing files and school data bases and by administering several instruments to the students. The following data elements were acquired: General Achievement data, Grade Point Average, Attendance Record, Course review for the previous year, Career Maturity and Attitude toward a number of school and technology related factors. The following table presents a summary of Tech Prep students at Mishawaka High School.

Pretest Data Summary for Tech Prep Students

Mishawaka High School
Tech Prep Group
(n = 15)

	MEAN	Std Dev
CAT Achievement		
Math	43.57	27.17
Reading	37.64	19.69
Language	34.79	15.20
# Days Absent 1988-89	4.9	3.19
Grade Point Average (end of 1988-89)	1.79	1.50
Gender		
Male	6	
Female	9	
Career Maturity	49.27	6.26
Attitude Toward:		
Teachers	74.22	12.18
Courses	65.78	10.35
School(Gen.)	64.19	11.13
Schedule	64.33	12.09
Further Ed.	73.33	7.97
Technological Careers	70.96	10.16
Technology	55.37	5.41

Faculty

Five teachers were involved in providing direct instruction in the Tech Prep courses during the first year pilot. All of the teachers are experienced and licensed in their subject matter by the state of Indiana. An important quality of the staff selected at MHS was the teachers' willingness to change and to remain dynamic, constantly working throughout the year on improving their strategies. For the most part, these teachers volunteered to become involved because of their belief and commitment that more could be done to serve the non-focussed student.

Diane Chaddock, assisted by Kay Rybicki provides leadership for the Project as well as remaining on staff part time at Ivy Tech. The dedication and commitment of these two professionals was most apparent to the external evaluators. They have developed a great working relationship with the MHS staff, administrators, counselors, and business community. The added bonus of having an Ivy Tech staff member as the Project Manager has been the continuing good relationship between the high school and college. Following is a list of the teachers and the Tech Prep courses taught during the pilot year:

James Braunsdorf--Principles of Technology

Ed Chamberlin--Communications

Pat Albert--Computer Applications

Steve Clason--Math for Technology

Dave Dobrzykowski--Physical Science

Facilities and Equipment

The facilities used for the Tech Prep courses at MHS during the pilot year were the same as used previously for more traditional course instruction. Each of the courses were taught in separate rooms rather than in a common, single laboratory. The Computer Applications course was taught in a lab that previously had been used for typing. This room was somewhat modified with the addition of the personal computer equipment. The addition of several more printers, and possibly a teaching console would greatly enhance instruction in this lab. The Principles of Technology course was taught in a lab that was modified with the addition of equipment manufactured specifically for the curriculum. The remaining courses required little modification other than the addition of some specialized equipment.

Probably most unique is the teaching of the communications in a suite of rooms that are also used as a production television studio. This facility seemed to greatly

enhance the practical application of communications and provided an excellent setting for testing and retesting the students' performance.

Approximately 55 percent of the 225,337 first year grant or $123,298 has been expended on equipping the facilities for the Tech Prep courses. Of that amount, the majority of the funds were used to equip the Computer Applications and Principles of Technology labs. The staff seems to have found the facilities satisfactory for the most part, although some rooms may seem crowded as the enrollments expand.

Development Activities

One of the major strengths of the MHS effort in the planning, development, implementation, and operation of the pilot has been the establishment and continued use of a very active committee structure.

All committees were given specific responsibilities with their progress continuously being monitored by the Coordinating Council. Although all committees have performed exceptionally well, the Student Services/Marketing, Evaluation, and recently activated Business/Industry Council seem to be the most active at the time of the consultant's last visit.

After the initial planning phase was concluded and the project received state approval, the selected staff attended a week long inservice workshop on team building, development of performance based curriculum, learning styles, and teaching problem solving. Additionally, the staff has attended a number of relevant workshops, e.g., New York Tech Prep Conference, P.D. Tech Prep Conference in North Carolina, the Regional American Technical Education Association Conference, South Bend, Indiana, the National Tech Prep Conference in Ohio sponsored by Cord, NASDVE, and the AACJC.

Curriculum development involved the DACUM process to determine and/or identify the competencies within a specific occupational area. While using this process, it became apparent to the initial group that a common core of competencies existed regardless of the specific occupational intent. This discovery led to the development of the core curriculum in math, science, communications and computer applications. The curriculum committee, primarily composed of instructional staff, proceeded to develop the individual courses using materials such as Applied Communications, Math, Principles of Technology, sample curriculums from other sources, problem-solving information, and performance based techniques.

During the pilot year, as the core courses were being implemented, DACUM workshops were conducted in the Business Technologies and Applied Engineering/Manufacturing Technologies. The DACUM charts were then used as a foundation for curriculum development for Technology specific courses which will be implemented in the second year of the pilot. The identification of the competencies

in these technological fields verified the existence of a common core that had been discovered from the DACUM process for the Health Technologies.

In addition to the curriculum development efforts, the Tech Prep staff and committees developed marketing and recruitment efforts, evaluation strategies, inservice activities on additional teaching techniques, and articulation agreements with Ivy Tech, Purdue, and IUSB. By year's end, many of these efforts had been put into place and positive results were becoming evident.

Prototype Description

Bartholomew Consolidated School Corporation
Columbus, Indiana

Program Description

Setting

Bartholomew County, located in south central Indiana, has an estimated population of 67,000 people. The growth rate is expected to slow through the year 2000, increasing by only 2,000 people by 1990. Urban areas make up 48% of that population, while 52% are listed as rural.

Up until 1979, graduates of the Bartholomew County high schools counted on getting jobs with a major local industry. With the growing reality of international competition, that secure knowledge of the potential for a well paying job and benefits began to disappear. Bartholomew County's economic base has been in transition for many years from a predominantly heavy manufacturing base to a more diverse, service-oriented base. Emphasis now is on businesses that can change quickly and still respond to customer demands. Service industries, in particular, are greatly affected by technology.

Bartholomew County has a large student population between the most and least gifted who need better preparation for the post high school job market. The County has 11 elementary schools, two middle schools, and two four year high schools. Columbus North High School is the older of the two and has an enrollment of approximately 1900 students. It is a comprehensive high school and serves as an area vocational center for four additional high schools in the area. Columbus East is also a comprehensive high school with an enrollment of approximately 1300 students.

Management and Committee Structure

At Columbus there is a six member team with primary responsibility to monitor and implement the tech prep program. The Project Manager functions as half time coordinator and supervisor of the project. Communication, dissemination of materials and administration are the key duties of the Manager.

- The 26 member community group, called the Action Group, helps with publicity, communication and keeping Tech Prep up-to-date in terms of economic conditions and needs.
- Academic and technical teachers from secondary and post secondary institutions form Design Teams to write curriculum and/or teach the classes.
- 4 member steering committee works closely with school scheduling and requirements, establishes program priorities, and reviews progress.

Program Goals and Objectives

Each of the Technology Preparation curricula within the BCSC pilot program is focused on achieving the following goals and objectives:

Goals

- Prepare students to become citizens who are able to use the technology of today's world to enhance the quality of life in the community, the state, and ultimately the nation.
- Encourage students to acquire academic and job skills in an effective and efficient manner.
- Foster computer literacy for high school students.
- Promote success in further education and in the business world.
- Strengthen business and education partnerships and communication.

Objectives

- To encourage teachers, guidance counselors, and administrators to cooperatively use technology for effective instruction of basic skills.
- To provide students a focus for a career or course of study.
- To involve business, industry and labor representatives with teaching professionals in the development, implementation, articulation and evaluation of Technology Preparation curriculum.
- To increase the employability potential of students completing the Technology Preparation program.
- To develop an understanding of the value of life long learning.

Curriculum

Columbus high schools offer a Tech Prep option for all students that is not confined to one subject area; but rather is a curriculum that students can take regardless of their career goal. The Tech Prep curriculum is not occupation specific, but emphasizes basic concepts students can adapt to future education or work.

A Futures Group, organized to identify emerging technologies in the region, specified Manufacturing Technologies, Health, Agriculture Technologies, and Business Technologies as those areas that will provide the largest growth in job clusters over the next five to ten years. During the 1989-90 pilot year, the Tech Prep curriculum focused on Manufacturing and Industrial Technologies. During the second year, the foundation in basic knowledge of math, English, and science will be enhanced with Tech Prep classes related to Health and Business Technologies.

Within this framework, the Columbus pilot program utilizes two approaches which were designed to meet the needs of both area vocational and comprehensive high schools and both large and small corporations.

Plan A - Tech Intensive is designed to serve either area vocational or comprehensive high schools. Students can travel to the tech prep site for a significant block of time to benefit from the equipment and teacher expertise of that school. In this plan students are enrolled in a core of Tech Prep courses.

Plan B - Tech Elective will serve a large student body or a smaller high school with limited funds or access to equipment. It starts slower, but could be expanded to a four year program. This approach could also be implemented more quickly. In this plan students take individual tech prep courses as electives.

The following is a description of the first year Tech Prep curriculum as it was piloted during the 1989-90 school year and plans for year 2. Plan A - Tech Intensive was piloted at Columbus North High School. The Chemistry Technology course (Plan B - Tech Elective) was also piloted at Columbus North High School. The Electro/Physics Technology course (Plan B - Tech Electives) was piloted at Columbus East High School.

Year 1

Plan A - Tech Intensive

1st Semester

TP Integrated Math - AlGeoTrig (1 math credit)

TP Integrated Physics - (1 science credit)

TP Composition - Communications (1 English credit)

2nd Semester

TP Integrated Math - AlGeoTrig (1 math credit)

TP Integrated Physics - (1 science credit)

Experiences in Technology - (1 technology credit)

Plan B - Tech Electives

1st Semester

Electro/Physics Technology (1 science and 1 technology credit)

Chemistry Technology (1 science credit)

2nd Semester

Electro/Physics Technology (1 science and 1 technology credit)

Chemistry Technology (1 science credit)

Year 2

During Year 2 of the pilot program several additions and changes are planned. Core courses to be further refined and tested include TP Composition - Communications, TP Integrated Math - AlGeoTrig, Integrated Physics, and Experiences in Technology. These courses will be taught at North High School, with the exception of TP Composition - Communications and TP Integrated Math - AlGeoTrig taught at both high schools.

Elective courses to be taught next year are available to students in grades 10 - 12. Those courses are Chemistry Technology and Electro/Physics Technology. The two year AlGeoTrig course will be changed to grades 10 and 11 which represents a more natural progression for students and should encourage enrollment. The TP Composition - Communications course will be expanded to two semesters at Columbus East High School. Also, the courses in the Tech Intensive Plan will be offered in a block of time. There will be a core of students enrolled in all three courses.

In addition to these changes, three new Tech Electives courses will be piloted. Manufacturing Technology will be offered at North High School as a 1 year course. Medical Biology will be offered at East High School as a 1 year course and Computer Power will be offered at East High School as a 1 semester course.

Students

Student enrollment in Columbus Tech Prep classes was 53 at the conclusion of the 1989-90 school year. A variety of measures were used to recruit these students. All freshmen and sophomore students were given an overview of Tech Prep through study hall presentations and promotions. After working with the Math Department, the Project Manager visited all Pre-Algebra and Algebra 1-2 classes in the winter to encourage students to take Tech Prep. Objectives of the curriculum and proposed teaching methods were emphasized. Business leaders were recruited to accompany the Project Manager to share perspectives on technical education.

Parents of interested students attended an informational meeting presented by Tech Prep teachers, post secondary staff, and business representatives. Tech Prep course descriptions were included in the curriculum guides of Columbus East and North High Schools.

A special effort was made to recruit a broad mix of students. Males and females were encouraged to enter non-traditional technical fields. Those students who usually take only the required amount of math and science were recruited for Tech Prep.

The Columbus Tech Program utilizes two approaches: Tech Intensive and Tech Elective. The rationale for using two approaches is to explore whether a block of focused classes or single elective classes provide more effective technology education and to determine if students are more attracted to one approach or the other.

Plan A - Tech Intensive. Seventeen students were selected by teachers and guidance counselors to take the "tech intensive" curriculum at Columbus North High School (i.e. three Tech Prep courses each semester) during the first pilot year. These students were incoming juniors who demonstrated average to above average ability and an interest in technology. The students had completed Pre-Algebra or the equivalent and were unsure about post secondary education. They were enrolled in the "tech intensive" curriculum after student and parent acceptance was obtained. All 17 students completed the entire school year in the program.

Plan B - Tech Elective. Twenty-six students who had signed up for chemistry at Columbus North High School were enrolled in the Tech Prep Chemistry Technology class. Since the students had signed up for a traditional class, parents and students were informed of the change and given an option to drop the class. Only two students dropped the class. Twenty-four students completed the entire year. Twelve students who had enrolled in physics at Columbus East High School were selected for the two hour Electro/Physics Technology class. All 12 students completed the entire year.

Approximately 50 students (25 at each high school) will be enrolled in the Plan A - Tech Intensive approach in year 2. Recruitment of these students was done primarily by the Project Manager in sophomore level math classes. Counselors, administrators, and teachers also encouraged appropriate students to take the Tech Intensive classes.

Enrollment in the Plan B - Tech Electives courses has expanded to approximately 70 students for year 2. Recruitment of these students was done by the classroom teachers and department chairs. Those teachers involved in Tech Prep classes went to the teachers of feeder classes in their area and asked for names of students who might be interested. Then the Project Manager, counselors and/or principals talked to each one individually.

Pretest Data Summary for Tech Prep Students

Tech Prep Intensive: Columbus North High School

	Tech Prep Group (n = 17) MEAN	Std Dev
ISTEP Achievement		
Math	70.82	22.35
Verbal	62.53	24.86
# Days Absent 1988-89	4.59	5.20
Grade Point Average (end of 1988-89)	5.65	.95
Gender		
Male	13	
Female	4	
Career Maturity	52.53	11.52
Attitude Toward:		
Teachers	66.46	17.53
Courses	68.89	10.80
School(Gen.)	63.21	13.55
Schedule	65.63	12.23
Further Ed.	73.13	12.13
Technological Careers	68.89	13.77
Technology	49.10	11.00

Pretest Data Summary for Tech Prep Students

Columbus East High School
Tech Prep Group
(n = 11)

	MEAN	Std Dev
ISTEP Achievement (8th Grade)		
Math	84.90	12.32
Verbal	75.80	24.22
# Days Absent 1988-89	6.27	6.29
Grade Point Average (end of 1988-89)	7.31	1.29
Gender		
Male	8	
Female	3	
Career Maturity	45.82	5.51
Attitude Toward:		
Teachers	71.82	11.02
Courses	62.83	8.65
School(Gen.)	59.22	11.11
Schedule	62.73	7.50
Further Ed.	70.30	13.26
Technological Careers	67.27	5.17
Technology	52.20	4.71

Pretest Data Summary for Tech Prep Students

Chem Tech at Columbus North High School

Tech Prep Group
(n = 23)

	MEAN	Std Dev
ISTEP Achievement (8th Grade)		
Math	82.65	14.10
Verbal	80.17	14.36
# Days Absent 1988-89	7.65	7.23
Grade Point Average (end of 1988-89)	6.86	1.95
Gender		
Male	9	
Female	14	
Career Maturity	47.91	14.10
Attitude Toward:		
Teachers	69.72	9.90
Courses	58.98	8.72
School(Gen.)	61.19	10.30
Schedule	63.54	8.23
Further Ed.	72.64	6.31
Technological Careers	65.46	8.44
Technology	54.19	8.28

Faculty

Eleven teachers were involved in Tech Prep during the first pilot year. Tech prep courses in the Columbus program were team taught by a technical and an academic teacher (with the exception of Chemistry Technology and Experiences in Technology). An important quality of the Tech Prep teachers at Columbus is their willingness to change. All volunteered to write and teach the curriculum because they saw that not all students were being adequately served. Most of the teachers have worked in business and industry either through summer internships, summer jobs, or apprentice teaching positions. Knowledge of the workplace and contact with business representatives made them more credible to their students and much more amenable to Tech Prep teaching. Each is an experienced teacher who has pursued advanced education and training in their field.

Marilyn Metzler provides leadership for the Columbus Tech Prep program in her capacity as Project Manager. Following is a list of the teachers and the Tech Prep courses they taught during the first pilot year:

John Henderson-- TP Integrated Physics (North H.S.)

Bill Linder -- TP Integrated Physics (North H.S.)

Gary Freeman -- TP Integrated Math (North H.S.)

Robin Cain -- TP Integrated Math (North H.S.)

Mike Disney -- TP Communications (North H.S.)

Mike Hayes -- TP Communications/Experiences in Tech (North H.S.)

Dennis Steele -- Experiences in Technology (North H.S.)

Denise Briner -- Chemistry Technology (North H.S.)

Dave Haines -- Chemistry Technology (North H.S.)

Harry Land -- Electro/Physics Technology (East H.S.)

Bob Kasting -- Electro/Physics Technology (East H.S.)

Facilities and Equipment

Existing laboratory and classroom facilities at both high schools were available and well suited for modification for Tech Prep instruction. The major task was to arrange work stations effectively and install necessary equipment.

Of the almost $437,000 Tech Prep budget, approximately $236,000 was spent on equipment and supplies. The vast majority of the remainder of the budget was spent on personnel. The majority of equipment expenditures went for computer equipment and software with a much smaller amount going for supplies.

Development Activities

Faculty Development. Technical and academic teachers selected to teach Tech Prep courses were organized as Design Teams to develop Tech Prep curriculum. From the outset attention to the needs of Tech Prep teachers has been viewed as critical to the success of the program. Opportunities were provided for them to learn about new equipment, methods, and to share with others.

In January, 1989 an inservice workshop was conducted by representatives of the Great Oaks Joint Vocational District, Cincinnati, Ohio for Design Team members to learn more about how to develop an integrated academic-technical curriculum. Design Team members and counselors were involved in a two day workshop before the beginning of the school year to acquaint them with software and equipment for Tech Prep. A second three hour inservice was held at the end of the first semester to review and update the curriculum. Tech Prep teachers also attended a statewide meeting of Tech Prep teachers to share ideas with and learn from other Tech Prep teachers.

More inservice activities are planned during the second year of the pilot. It is hoped that teachers can meet together more frequently and attend more statewide meetings of those involved in Tech Prep.

Curriculum Development. Tech Prep curriculum was developed by teachers working in Design Teams. During the winter of 1989, these Design Teams began work on curriculum outlines and worked independently to write performance based curriculum, set prerequisites, and determine needed equipment.

Curriculum outlines were reviewed by post secondary representatives with regard to desired learner outcomes and articulation. Design Teams then made revisions based on this feedback. Tech Prep teachers worked through the summer to further develop specifics of the Tech Prep curriculum.

During the school year, Tech Prep teachers used their joint planning time to review and augment the curriculum and classroom teaching. In addition, two formal curriculum reviews were conducted at the end of each semester. These reviews resulted in changes in content and delivery.

Summary of Student Gains

The implementation of a new curricular effort such as Tech Prep always raises questions regarding its' outcomes. Questions regarding its effectiveness are common. This aspect of the evaluation sought to establish a baseline from which gains could be measured. Additionally, it included a parallel control group that could be used in a comparison with the traditional program. Even though posttest scores were collected and analyzed, it was stated at the beginning of the evaluation that the true comparisons would be made after two, three and four years. This fact is due in part to the sensitivity of measuring instruments and the normal expectation of educational innovations.

Sample

The sample for this aspect of the evaluation included the Tech Prep students from each of the five sites. Additionally, a comparable control group was selected at each site. Since randomization was impossible in the selection of either group (an occurrence common to almost all experimental inquiry in educational settings) the statistical technique called Analysis of Covariance (ANOCOVA) was used. This technique makes statistical adjustments in posttest scores based on differences that are identified among groups on pretest scores. Essentially, ANOCOVA equates groups that are initially different.

In the case of all sites, a class of students was selected as the control group. This class was selected as representing students in the general education curriculum who were judged to have similar capabilities as the Tech Prep group. In most cases, this group was a class of Introductory Algebra students.

Instruments

This part of the study relied on both existing performance data and on newly collected information. Achievement test results, absentee rates, and grade point average were acquired from student files. Career maturity and attitude toward a variety of education and technology related issues were assessed through the administration of two instruments. The Career Maturity Inventory, Attitude Scale was used to measure Career Maturity. A specially designed, instrument was used to measure student attitudes. The following factors were included in the attitude instrument (Student Reaction Form): attitude toward teachers, attitude toward courses, attitude toward school, attitude toward schedule, attitude toward further education, attitude toward technological careers, and attitude toward technology. The appendix includes a sample of each instrument.

Procedure

During the last week of October and the first week of November, the Career Maturity Inventory and the Student Reaction Form were administered to both Tech Prep and control group students at each site. Data were extracted from student files regarding achievement, absenteeism and grade point averages. The lateness in the collection of pretest data (ideally it should have been done during the first week of school) was due to uncontrollable scheduling difficulties with the contractual aspects of the evaluation contract.

The same data were collected at the close of the school year in late May of 1990. In two cases, problems were encountered and data collection was incomplete. In one site the control group was not posttested. In a second site, neither the control group nor the Tech Prep group were posttested. These groups will, however, be included in subsequent testing during year two of the effort.

Results

The tables presented on the following pages include mean scores and standard deviation for both control and Tech Prep groups at each site (with the exception cited above). An asterisk is placed next to those posttest means that were significantly different between the Tech Prep and Control Group using Analysis of Covariance. A footnote is included that describes each difference.

It should be noted that posttest scores were not obtained for achievement in math, reading and language. These scores will be obtained during the 12th grade for both Tech Prep and control group students.

An interpretation of student gain results is provided as a conclusions on page 80.

Pretest and Posttest Data Summary for Tech Prep and Control Group Students

Bloomington South High School

	Tech Prep Group (n = 22) MEAN SCORES		Control Group (n = 22) MEAN SCORES	
	Pretest	Posttest	Pretest	Posttest
ISTEP Achievement (8th Grade)				
Math	49.70		49.85	
Reading	55.05		56.10	
Language	37.25		44.10	
# Days Absent 1988-89	12.20	9.67	5.95	7.25
Grade Point Average (end of 1988-89)	1.96	2.07	2.37	2.29
Gender				
Male	19		13	
Female	3		9	
Career Maturity	48.73	42.63	51.50	44.39
Attitude Toward:				
Teachers	65.51	60.78	64.05	62.04
Courses	59.03	64.44	62.94	63.58
School(Gen.)	64.60	62.52	60.20	68.25
Schedule	71.09	52.06	65.54	54.17
Further Ed.	69.71	67.25	65.71	66.67
Technological Careers	69.28	67.45	61.51	60.37
Technology	52.41	61.04	52.57	55.49

No significant differences(.05) were found between the Tech Prep group and the Control Group

Pretest and posttest Data Summary for Tech Prep and Control Group Students

Bloomington North High School

	Tech Prep Group (n = 25) MEAN SCORES		Control Group (n = 25) MEAN SCORES	
	Pretest	Posttest	Pretest	Posttest
ISTEP Achievement (8th Grade)				
Math	49.92		48.76	
Reading	52.40		47.48	
Language	47.72		54.40	
# Days Absent 1988-89	5.96	6.5	6.2	7.5
Grade Point Average (end of 1988-89)	2.13	2.38*	2.11	2.01*
Gender				
Male	20		15	
Female	5		10	
Career Maturity	47.84	47.64	46.76	46.58
Attitude Toward:				
Teachers	61.60	54.64**	66.19	64.07**
Courses	67.33	64.60	59.76	61.89
School(Gen.)	74.18	73.16***	63.57	70.48***
Schedule	49.81	45.36	69.82	54.44
Further Ed.	74.32	73.10	70.00	69.88
Technological Careers	75.97	72.86	63.73	64.53
Technology	68.86	67.17	53.27	60.28

*The Tech Prep group had a significantly higher grade point average than the control group ($p = .02$)
**The control group had a significantly higher mean on attitude toward teachers ($p = .01$)
***The control group had a significantly higher attitude toward school ($p = .02$)

Pretest and Posttest Data Summary for Tech Prep and Control Group Students

North Montgomery High School

	Tech Prep Group (n = 29) MEAN SCORES		Control Group (n = 27) MEAN SCORES	
	Pretest	Posttest	Pretest	Posttest
CAT Achievement				
Math	57.76		68.44	
Reading	46.32		60.93	
Language	52.04		65.81	
# Days Absent 1988-89	5.15	9.46	6.48	
Grade Point Average (end of 1988-89)	2.04	2.08	2.57	
Gender				
Male	12		6	
Female	17		21	
Career Maturity	45.21	43.37	45.29	
Attitude Toward:				
Teachers	71.15	71.33	67.38	
Courses	60.61	66.58	57.54	
School(Gen.)	63.84	70.97	64.49	
Schedule	67.93	51.40	68.39	
Further Ed.	70.69	75.20	66.43	
Technological Careers	65.52	69.60	63.02	
Technology	49.55	65.42	52.65	

Comparisons between the Tech Prep and the Control Group could not be made due to incomplete data.

Pretest and Posttest Data Summary for Tech Prep and Control Group Students

	Ben Davis High School			
	Tech Prep Group (n = 22) MEAN SCORES		Control Group (n = 16) MEAN SCORES	
	Pretest	Posttest	Pretest	Posttest
CAT Achievement				
Math	56.11		59.56	
Reading	50.33		43.88	
Language	41.06		49.63	
# Days Absent 1988-89	12.55	15.05	9.06	11.33
Grade Point Average (end of 1988-89)	2.13	1.88	2.09	2.15
Gender				
Male	13		6	
Female	9		10	
Career Maturity	47.59	52.88*	49.56	44.00*
Attitude Toward:				
Teachers	72.24	70.22	73.02	68.96
Courses	72.59	72.30	67.51	68.33
School(Gen.)	72.24	72.57	63.54	70.89
Schedule	58.57	60.00	63.10	55.63
Further Ed.	70.95	75.33	71.90	74.38
Technological Careers	74.39	77.93**	67.62	70.56**
Technology	67.88	69.64	51.99	68.36

* The Tech Prep group was significantly higher on the Career Maturity Inventory (p = .009)
**The Tech Prep group was significantly higher on attitude toward technological careers than the control group (p = .03)

Pretest and Posttest Data Summary for Tech Prep and Control Group Students

Mishawaka High School

	Tech Prep Group (n = 15) MEAN SCORES		Control Group (n = 15) MEAN SCORES	
	Pretest	Posttest	Pretest	Posttest
CAT Achievement				
Math	43.57		55.10	
Reading	37.64		45.30	
Language	34.79		44.90	
# Days Absent 1988-89	4.9		5.93	
Grade Point Average (end of 1988-89)	1.79		2.19	
Gender				
Male	6		6	
Female	9		9	
Career Maturity	49.27		46.80	
Attitude Toward:				
Teachers	74.22		71.43	
Courses	65.78		59.37	
School(Gen.)	64.19		64.49	
Schedule	64.33		63.21	
Further Ed.	73.33		70.48	
Technological Careers	70.96		63.97	
Technology	55.37		51.89	

Comparisons between the Tech Prep and the Control Group could not be made due to incomplete data.

Pretest and Posttest Data Summary for Tech Prep and Control Group Students

Tech Prep Intensive: Columbus North High School

	Tech Prep Group (n = 17) MEAN SCORES		Control Group (n = 14) MEAN SCORES	
	Pretest	Posttest	Pretest	Posttest
ISTEP Achievement				
Math	70.82		78.85	
Verbal	62.53		74.57	
# Days Absent 1988-89	4.59	10.70	6.00	12.82
Grade Point Average (end of 1988-89)	5.65	5.49*	5.84	5.89*
Gender				
Male	13		9	
Female	4		5	
Career Maturity	52.53	45.56	52.14	47.88
Attitude Toward:				
Teachers	66.46	68.82	68.15	71.18
Courses	68.89	68.76	64.07	63.01
School(Gen.)	63.21	73.11	64.29	72.61
Schedule	65.63	55.88	67.78	57.94
Further Ed.	73.13	70.20	71.11	70.39
Technological Careers	68.89	70.85	63.95	67.19
Technology	49.10	64.27	55.36	66.02

*The Control Group had a significantly higher grade point average than the Tech Prep Group (p = .05)

Pretest and Posttest Data Summary for Tech Prep and Control Group Students

Columbus East High School

	Tech Prep Group (n = 11) MEAN SCORES		Control Group (n =) MEAN SCORES	
	Pretest	Posttest	Pretest	Posttest
ISTEP Achievement (8th Grade)				
Math	84.90			
Verbal	75.80			
# Days Absent 1988-89	6.27	10.39		
Grade Point Average (end of 1988-89)	7.31	7.32		
Gender				
Male	8			
Female	3			
Career Maturity	45.82	46.56		
Attitude Toward:				
Teachers	71.82	75.19		
Courses	62.83	66.67		
School(Gen.)	59.22	79.68		
Schedule	62.73	63.89		
Further Ed.	70.30	76.30		
Technological Careers	67.27	71.11		
Technology	52.20	69.17		

Pretest and Posttest Data Summary for Tech Prep and Control Group Students

Chem Tech at Columbus North High School

	Tech Prep Group (n = 23) MEAN SCORES		Control Group (n =) MEAN SCORES	
	Pretest	Posttest	Pretest	Posttest
ISTEP Achievement (8th Grade)				
Math	82.65			
Verbal	80.17			
# Days Absent 1988-89	7.65	8.14		
Grade Point Average (end of 1988-89)	6.86	6.83		
Gender				
Male	9			
Female	14			
Career Maturity	47.91	51.80		
Attitude Toward:				
Teachers	69.72	76.00		
Courses	58.98	64.89		
School(Gen.)	61.19	81.71		
Schedule	63.54	60.00		
Further Ed.	72.64	76.00		
Technological Careers	65.46	68.00		
Technology	54.19	63.70		

Summary of Survey Results

A series of three different surveys were conducted to provide an indication of how three different audiences perceive the potential utility of Tech Prep and its various components. These three audiences included: secondary educators (teachers, counselors and administrators); post secondary personnel; and business, industry and labor personnel,. The three surveys and their corresponding results are presented in the following sections.

SECONDARY SCHOOL EDUCATOR SURVEY

The secondary school educator survey was focussed on gaining the perspective and inputs from personnel within the five Tech Prep sites. These educators included staff who were not directly involved in the Tech Prep effort.

Sample

The sample for this survey was selected by each of the Tech Prep managers. They were provided and instrument and a cover letter and were asked to place each in all faculty. counselor and administrator mail boxes. The responding group was comprised of the numbers presented in table 1.

Table 1

Responding Sample to the Secondary Survey

Academic instructor	79
Vocational Instructor	10
Counselor	26
Administrator	31
Other	5

Instrument

A survey instrument was developed around several factors that were identified through discussions with Tech Prep Managers. These factors resulted in one or more items in the instrument. Each factor produced a subscore for the results. The result was a fourteen item questionnaire called the "Tech Prep Feedback Form: Secondary". One item included five parts and asked the respondents to rate five elements of Tech Prep on a four point scale that ranged from "Not Good" to "Very Good". Nine items asked the respondent to indicate their level of agreement with

the statements that were presented on a four point scale that ranged from "Strongly Disagree" to Strongly Agree". The remaining three items were open ended. The instrument was printed on an oversize post card with a return address and postage on the opposite side (see appendix).

Procedure

The instrument was distributed to faculty, counselor and administrator mail boxes between May 15 and May 22 of 1990. Respondents completed the form and dropped it in the mail. All instruments were mailed directly to Evaluation Consultants.

Results

Responses were coded and entered into a microcomputer based statistical program called Microstat. The entered data were summarized using descriptive statistics and frequency counts. The following tables present a summary of responses to each item.

Table 2

Responses to the item that asked respondents to "Please indicate your opinion regarding the desirability of the following Tech Prep Program elements:

	Not good 1	2	3	Very good 4	Mean	Standard Deviation
a. The use of real life application in teaching					3.58	.62
b. The use of precise student performance standards					3.21	.79
c. The integration of subject matter across courses (math, science, communications, technology)					3.50	.72
d. The articulation of secondary programs with 2 and 4 yr post secondary technology programs					3.26	.87
e. The focus on those in the general education curriculum					3.26	.83

Table 3

Summary of responses to the items that respondents were asked to "Indicate your level of agreement with the following statements".

	Strongly Disagree 1	2	3	Strongly Agree 4	Mean	Standard Deviation
3. Tech Prep shows great promise for many students in our school					3.17	.89
4. Tech Prep should be a separate program for some students					2.47	1.00
5. Tech Prep concepts should be incorporated into our entire curriculum					2.77	.97
6. Tech Prep is just another short lived innovation					1.93	.86
7. Tech Prep will help motivate many students					2.84	.79
8. I am concerned that Tech Prep will take my students					1.48	.85
9. I am reasonably well informed about Tech Prep					2.95	.89
10. I would like to know more about Tech Prep					2.84	.97

Table 4

Representative and dominant responses to the open ended question "What are the positive aspects and potential effects you see for Tech Prep?

- More knowledgeable, prepared people for college or the work world
- More attention given to average ability students
- Real world applications across the curriculum; relationships between what is learned and the real world becomes clearer
- Students see the relevance of curriculum/school
- Students are more motivated; gives general education students a focus
- Integration of subject matter; promotes collaborative problem solving among teachers
- Preparation for life-long learning skills
- Not much
- Encourages higher expectations of students; raises curriculum standards in general classes
- Provides opportunity for learning on equipment that is otherwise not available
- Increased student understanding of future expectations

- It will encourage/allow more students to go to college; creates student concern about post secondary plans
- Incorporates vocational and academic resources in a 4 year program
- Assists students in making career choices
- Students lose fear of computers and technical equipment - instills confidence
- Creates a better liaison between schools and business community
- Program is geared for the correct students; provides a meaningful alternative
- Students like it
- Improves students' math, science and communication skills
- Curriculum addresses the needs of business

Table 5

Representative and dominant responses to the open ended question "What are the negative aspects and potential effects you see for Tech Prep?

- Segregation/separation from student body; could create greater separation than already exists
- This "model" will be applied to all areas of the curriculum (i.e., be the latest cure all for education problems)
- The scope of the program is too narrow - just educating for work
- Afraid colleges will not accept courses
- The wrong students will get in the program; it will become a dumping ground
- Watering down subjects - lowering standards; not enough reading and writing
- None
- Forces students to make choices far too early; too many required courses; students are trapped
- Program will not work without quality teachers - will be short-lived
- Program does not have a positive image among most teachers
- Too costly in relation to other programs; it will never be adequately funded
- Very little guidance from the State; teachers asked to do a job they are not prepared for
- Too much emphasis on precise, standardized test/competency measurement
- Too much preparation time for teachers and scheduling problems
- Three hour time blocks limits students' options for other classes
- Some programs may be too technical to attract students
- It will be seen as a fad and will lose its impact
- Reduces enrollments in other courses and program areas
- Appears to be replacing vocational education
- Not enough lead time to prepare
- Wrong students in the program
- Some teachers involved lack motivation - required to do the job
- It is trying to be all things to all people - vocational and college prep
- Keeps students together too much
- Encourages tracking

Table 6

Representative and dominant responses to the open ended question "What suggestions do you have for enhancing the impact of Tech Prep within your school?"

- Improved and increased communication and information about Tech Prep to all staff and students
- Counselors need to be better informed
- Tech Prep curriculum needs to be announced much sooner to be incorporated into the school program
- Screening of students and orientation to programs
- Much more training for teachers
- Slower implementation period; teachers need time to learn equipment
- More lead time for planning
- Allow school to use tech prep "ideas" for all students
- Push for cross-discipline curriculum; do not separate the program
- Involve more students
- Increase input from business and industry
- Improve articulation with post secondary institutions
- Change the name
- Recruit top teachers for tech prep
- Allow students to elect tech prep courses rather than force them into a 3 year requirement
- Clarify what the program is designed for; clearer explanation of the three tech prep areas
- Better direction is needed from the State
- Expand program; offer more courses; enroll more students
- Show the students the relationship between tech prep and vocational education
- Require a higher grade point average to enter tech prep
- Start program in 10th grade
- Increased state funding
- Involve as many teachers as possible

Conclusions from Secondary Educator Survey

- There is overwhelming agreement that the use of applications in teaching and the integration of subject matter across courses are desireable elements of Tech Prep.
- There is strong support but less agreement on the desirability of the use of precise performance standards,articulation of programs, and the focus on the general education student population.
- Secondary personnel believe that Tech Prep shows great promise for serving many of their students.

- There is mixed reactions to whether Tech Prep concepts should be incorporated into the entire curriculum or whether it should be a separate program.
- Secondary people, in general, do not view Tech Prep as a short lived innovation.
- For the most part, secondary personnel are not worried about Tech Prep taking away their students.
- There is a general feeling that Tech Prep students will be more knowledgeable and prepared for post secondary education or the work world.
- Many secondary people see the potential for Tech Prep motivating students for current and continued learning. They also think it has the potential for providing more attention to average ability students and raising curriculum standards in regular courses.
- There was some concern expressed about the tracking and/or physical segregation of Tech Prep students from other students.
- There is an expressed need by secondary personnel for improved communication and information about Tech Prep to all staff and students.
- There is need for teacher training in the concepts of Tech Prep to facilitate widespread implementation.

POST SECONDARY SCHOOL EDUCATOR SURVEY

The post secondary school educator survey was focussed on gaining the perspective and inputs from personnel in 2 and 4 year post secondary institutions to which Tech Prep students might matriculate within each of the five Tech Prep sites.

Sample

The sample for this survey was selected by each of the Tech Prep managers. They were provided an instrument and a cover letter and were asked to deliver each to faculty, counselors, admissions personnel and administrators in post secondary institutions. The responding group was comprised of the numbers presented in table 1.

Table 1

Responding Sample to the Post Secondary Survey

Academic instructor	15
Occupational/Career Instructor	8
Counselor	1
Administrator	13
Admissions Officer	1

Instrument

A survey instrument was developed around several factors that were identified through discussions with Tech Prep Managers. These factors resulted in one or more items in the instrument. The result was a fourteen item questionnaire called the "Tech Prep Feedback Form: Post Secondary". One item included five parts and asked the respondents to rate five elements of Tech Prep on a four point scale that ranged from "Not Good" to "Very Good". Eight items asked the respondent to indicate their level of agreement with the statements that were presented on a four point scale that ranged from "Strongly Disagree" to "Strongly Agree". The remaining four items were open ended. The instrument was printed on an oversized post card with a return address and postage on the opposite side (see appendix).

Procedure

The instrument was distributed in person or by mail to post secondary personnel between May 15 and May 22, 1990. Respondents completed the form and dropped it in the mail. All instruments were mailed directly to Evaluation Consultants.

Results

Responses were coded and entered into a microcomputer based statistical program called Microstat. The entered data were summarized using descriptive statistics and frequency counts. The following tables present a summary of responses to each item.

Table 2

Responses to the item that asked respondents to "Please indicate your opinion regarding the desirability of the following Tech Prep Program elements:

Not good 1	2	3	Very good 4	Mean	Standard Deviation
a. The use of real life application in teaching				3.73	.50
b. The use of precise student performance standards				3.39	.70
c. The integration of subject matter across courses (math, science, communications, technology)				3.68	.57
d. The articulation of secondary programs with 2 and 4 yr post secondary technology programs				3.34	.88
e. The focus on those in the general education curriculum				3.29	.75

Table 3

Summary of responses to the items that respondents were asked to "Indicate your level of agreement with the following statements".

Strongly Disagree 1	2	3	Strongly Agree 4	Mean	Standard Deviation
3. Tech Prep will make our post secondary programs more efficient				3.34	.67
4. Tech Prep concepts, cited above, should be incorporated into our post secondary curriculum				3.38	.68
5. Tech Prep is just another short lived innovation				1.58	.73
6. I am reasonably well informed about Tech Prep				3.20	1.01
7. I would like to know more about Tech Prep				2.89	.99
8. I would like to be more involved with Tech Prep				2.92	.83

9. Tech Prep should help us in recruiting students	3.33	.77
10. Tech prep should eliminate some of our need for remedial instruction	3.13	.77

Table 4

Representative and dominant responses to the open ended question "What are the positive aspects and potential effects you see for Tech Prep?

- More directed, motivated students
- Students who are better prepared for work
- Provides important opportunities for more students
- Instruction that is more real world and useful
- Good recruitment tool for post secondary institutions; increased knowledge of our programs and interest in technical careers
- Less remedial work will be required at the post secondary level

Table 5

Representative and dominant responses to the open ended question "What are the negative aspects and potential effects you see for Tech Prep?

- Wrong students are being encouraged to enter program
- Tech Prep is associated with lower intelligence
- Viewed as vocational education; still a dumping ground
- Encourages the perception that students must make an "either or" choice between 2 or 4 year institutions
- Counselors lack knowledge of Tech Prep
- Articulation will be/is a problem
- Great amount of planning time required
- Cost of laboratory equipment and materials needed
- Preparing teachers for Tech Prep
- Acceptance by universities

Table 6

Representative and dominant responses to the open ended question "What suggestions do you have for enhancing the impact of Tech Prep within your school?"

- Aggressive marketing program to community and parents (public information program)
- Improved communication between/among all parties
- Do not limit enrollment to general education students

- Get information to students earlier
- Get rid of the name - just do it

Table 7

Representative and dominant responses to the open ended question "What will your institution need to do to facilitate Tech Prep?"

- Money for equipment and materials
- Staff
- Marketing and information program to change attitudes of many staff
- Current/new syllabi and course outlines
- More information about Tech Prep
- Articulation (i.e., admission standards, transfer equivalence, testouts, etc)
- Employer Survey

Conclusions from Post Secondary Educator Survey

- There is overwhelming agreement that the use of applications in teaching and the integration of subject matter across courses are desireable elements of Tech Prep.
- There is strong support but less agreement on the desirability of the use of precise performance standards,articulation of programs, and the focus on the general education student population.
- Post secondary personnel have a concern regarding the students that are attracted to Tech Prep. Some perceive it to be associated with lower level students, a dumping ground, a voc ed program.
- Post secondary personnel believe that the elements of Tech Prep should also be incorporated at their level of instruction. However, they recognize potential problems in implementation, eg. money for new equipment and materials and revision of courses.
- Tech Prep is not viewed as a short lived innovation by post secondary personnel. They view it as helpful in recruiting students, and believe it should eliminate some of the need for remedial instruction.
- Post secondary personnel identified: money for equipment and materials, qualified staff, and changes in organizational policy related to articulation as institutional needs for implementing Tech Prep at their institution.

BUSINESS, INDUSTRY, AND LABOR SURVEY

The business, industry, and labor survey was focussed on gaining the perspective and inputs from personnel in the private sector within the communities of the five prototype sites.

Sample

The sample for this survey was selected by each of the Tech Prep managers. They were provided and instrument and a cover letter and were asked to deliver each to business, industry and labor people whom were generally aware of Tech Prep. In many instances these people represent advisory board or committee members that were involved in the planning stages of Tech Prep projects. A total of 55 responses were obtained. Table 1 provides a geographic distribution of the sample by community.

Table 1

Responding Sample to the Business, Industry and Labor Survey

Bloomington	12
Linden/Lafayette	11
Indianapolis	3
Mishawaka/South Bend	15
Columbus	14

Instrument

A survey instrument was developed around several factors that were identified through discussions with Tech Prep Managers. These factors resulted in one or more items in the instrument. The result was a fourteen item questionnaire called the "Tech Prep Feedback Form: Employer". The instrument contained four dichotomous response items (yes-no), one checklist that contained ten elements, and three open ended items (see appendix). The instrument was printed on an oversize post card with a return address and postage on the opposite side (see appendix).

Procedure

The instrument was distributed by mail to respondents between May 15 and May 22 of 1990. Respondents completed the form and dropped it in the mail. All instruments were mailed directly to Evaluation Consultants.

Results

Responses were coded and entered into a microcomputer based statistical program called Microstat. The entered data were summarized using descriptive statistics and frequency counts. The following tables present a summary of responses to each item.

Table 2

Percentage of Responses to the Dichotomous Response Items

	Yes	No
1. Have you heard about Tech Prep?	91%	9%
2. Do you think there is a need for a program such as Tech Prep?	100%	0%
6. Would you like to know more about Tech Prep?	76%	24%
8. Would you like to be more involved with Tech Prep?	72%	28

Table 3

Representative and dominant responses to the open ended question "What benefits would such a program have to your business and the community?"

- It provides the business community with employees who have exposure to current technology
- Better prepared workers for business and industry
- Give students a better understanding of business and what is expected of them as they enter the workforce
- Should aid in dropout prevention

Table 4

Percentage Responses to a Checklist that asked "What types of involvement do you think business people should have in a Tech Prep Program?"

Serving on advisory committees/councils	100%
Providing sites for student field trips	100%
Providing speakers for classes	100%
Initiating student outreach activities	49%
Sharing business site facilities and equipment	46%
Making donations of staff time	63%
Making donations of equipment and materials	47%
Making donations of money for program needs	46%

Table 5

Representative and dominant responses to the open ended question "What suggestions do you have for keeping Tech Prep instruction current?"

- Involve business and industry people in curriculum development
- Have appropriate local business and industry people review curriculum materials
- Work with advisory committees or chamber of commerce to evaluate curriculum periodically
- Survey recent graduates to determine how well prepared they were and to get ideas for improvement
- Seek input from the business community - stay in touch
- Have instructors work in business and industry during the summers
- Conduct surveys to determine business and industry needs
- Get instructors more involved with business and industry
- Get good, qualified people involved and publicize the program
- Provide internships and tours for teachers
- Put business and industry people on curriculum committees
- Conduct semi-annual business - Tech Prep summit
- Increase state funding
- Establish joint business and education committees
- Educators need to listen better to what is being asked for by business and industry
- Establish very specific competency testing at all levels

Conclusions From Employer Survey

Almost all employers that were surveyed had heard about it and all of them think their is a need for it.

Employers believe that Tech Prep will provide a better informed and prepared workforce and will ensure exposure to new technology.

Employers identify a wide variety ways that they can be involved in Tech Prep. In fact, almost three fourths of the respondents would like to be more involved.

Employers express the desire to be continuously involved in curriculum review and up dating.

Conclusions

General Conclusions

a. Each pilot program is well managed. A great deal has been accomplished by this group of enthusiastic and competent individuals who have had only a part time assignment to Tech Prep.

b. All Tech Prep sites are staffed by committed and enthusiastic teachers.

c. Although each site has its particular strengths and differences, all have done a good job of planning, developing and implementing Tech Prep pilot activities.

d.There is no one curriculum model that emerges as the optimal or best one. Rather each has its own strengths and is focused on specific needs of the communities and students within these communities.

e.Tech Prep has not been labeled a science, math or vocational program in any of the sites. Instead it is viewed as a form of school reform that involves the use of different strategies of teaching for and about technology. This is viewed as a positive result, and it should facilitate widespread implementation.

f.There is agreement among Tech Prep staff and the evaluators that Tech Prep, to be effective in meeting the needs of students in the general education curriculum, must be packaged and marketed as an innovative approach to teaching foundations for working and living in an increasingly technological world.

g.The concept of delivering Tech Prep to intact student groups (several periods a day) has had positive consequences. It provides for greater opportunities for students to build strong relationships that are advantageous to cooperative learning and peer coaching. It also provides instructors the opportunity to integrate their instruction and assignments.

h.The concept of teaching Tech Prep to intact groups also has limitations and negative side effects. When students are locked into a cohort for the entire school day, they may feel isolated. Also, for the younger students (9th graders), the cohort gives some students the impression of middle or elementary school; and they may miss out on important socialization events from the isolation. This also creates a scheduling problem, particularly for smaller schools.

i.Similar planning processes have been followed in each site. However, late approval and school selection in one school corporation limited summer involvement.

j. Political and situational differences have resulted in varied awareness and understanding of Tech Prep by school personnel across sites.

k. The pending federal vocational education legislation includes considerable emphasis on "Tech Prep". However, the federal definition of Tech Prep is much more narrow and limiting than what is considered to be Indiana Tech Prep.

Key Question 1. Is the target population being served?

a. The Tech Prep efforts of the five pilot sites are effectively reaching the middle level, unfocussed, general education curriculum student. However, the target is so broad, including at risk students, average ability students, and upper ability students that the needs of all individuals can not be adequately met.

b.In general, the gender make up of the Tech Prep student group follows traditional patterns associated with designated occupational components of sites.

Key Question 2. Is progress being made toward achieving the program goals?

a.All sites have identified and built a substantive foundational core for Tech Prep programs. This core includes math, science, language arts, and introduction to technology.

b.There is general agreement among Tech Prep staff and the evaluators that Tech Prep foundations should begin earlier than the eleventh grade.

c. For the most part, excellent progress is being made toward accomplishing program goals at each site.

d. Some goals are broad and long range and their accomplishment will be difficult to measure for some time.

Key Question 3. Is the curriculum performance based?

a.Each site has its own unique format for curriculum materials and instructional planning.

b. Curriculum, for the most part, has been developed in a performance based format at all sites. Expected competencies have been identified and emphasis is placed on students' abilities to perform tasks as well as on learning how and why.

c. Curriculum development is a complex and evolutionary process. Excellent progress is being made toward implementing the performance based curricula. However, it needs to be refined, formalized and packaged.

d. Competency assessment is an important part of performance based curricula, and is typically accomplished in the later stages of curriculum implementation. All sites are making progress in this area.

Key Question 4. Are the science, math, and language arts courses being taught through practical application?

a. Courses included in the Tech Prep curriculum have used a great deal of application oriented instruction. This is the most differentiating aspect of Tech Prep math, science and language arts courses from other math, science and language arts courses.

b. The greatest amount of application oriented instruction occurs in science courses. It is usually easier to find applications in science than other areas.

c. Tech Prep teachers are experiencing more difficulty in finding and using applications in math and language arts than in science. However, the proportional increase in the use of application instruction is greater in math and language arts than in science.

Key Question 5. Are the student outcomes, in terms of competencies, the same as for similar courses taught in the traditional manner?

a.There is a great deal of similarity across sites in the topics or content taught in math and language arts instruction. There is more variation in the science area.

b. The content of Tech Prep courses is viewed as more complex and of a higher level than courses typically taken by the general education curriculum student. Additionally, teachers of Tech Prep strongly believe that the Tech Prep students are learning more from applications (i.e., problem solving skills, critical thinking skills, team work, willingness to try new things).

Key Question 6. How do local business, industry and labor groups perceive Tech Prep?

a.Local business, industry and labor groups are reacting very favorably to Tech Prep. This is evidenced by comments and actions on the part of individuals.

b.Employers believe that Tech Prep will provide a better informed and prepared workforce and will ensure exposure to new technology.

c.Employers identify a wide variety ways that they can be involved in Tech Prep. In fact, almost three fourths of the respondents would like to be more involved.

d.Employers express the desire to be continuously involved in curriculum review and up dating.

Key Question 7. How do post secondary personnel view Tech Prep?

a.The names of courses (course titles) have been identified as a delicate and critical element of Tech Prep implementation. Titles are important in communicating the content of courses for recruiting, for accurately describing course goals to school personnel, and in facilitating acceptance of courses in admission and placement decisions of post secondary institutions.

b.All sites included and involved post secondary personnel in the planning of Tech Prep activities. Extent of involvement beyond initial planning stages has varied across sites.

c. For the most part, progress has been slow in formalizing articulation agreements with post secondary institutions.

d.There is overwhelming agreement that the use of applications in teaching and the integration of subject matter across courses are desireable elements of Tech Prep.

e.There is strong support but less agreement on the desirability of the use of precise performance standards,articulation of programs, and the focus on the general education student population.

f.Post secondary personnel have a concern regarding the students that are attracted to Tech Prep. Some perceive it to be associated with lower level students, a dumping ground, a voc ed program.

g.Post secondary personnel believe that the elements of Tech Prep should also be incorporated at their level of instruction. However, they recognize potential problems in implementation, eg. money for new equipment and materials and revision of courses.

h.Tech Prep is not viewed as a short lived innovation by post secondary personnel. They view it as helpful in recruiting students, and believe it should eliminate some of the need for remedial instruction.

i. Post secondary personnel identified: money for equipment and materials, qualified staff, and changes in organizational policy related to articulation as institutional needs for implementing Tech Prep at their institution.

Key Question 8. What has been the impact of Tech Prep on school climate?

a. Tech Prep is a new program and it is difficult to note extensive effects on the climate and culture of schools. However, several initial influences have been noted.

(1) Some teachers, especially those who teach elective courses, have viewed Tech Prep as a threat to student enrollment. They think Tech Prep may draw students away from the courses they teach.

(2) Many Tech Prep teachers have altered the way(s) they teach in their other, non-Tech Prep courses to be more like Tech Prep.

(3) Increased interaction among teachers has been noted in all schools, with interdisciplinary cooperation and coordination occurring at most schools.

(4) Many teachers have indicated that Tech Prep has "revitalized" them and has provided a new mission.

Key Question 9. What changes have occurred in students' (1) attendance, (2) attitudes, (3) career maturity, and (4) grade point averages as a result of the program?

a. Tech Prep is providing an impetus to students for taking additional mathematics and science. Some students would not be taking the level of math and science offered through Tech Prep. Additionally, many students plan to take advanced math and science courses in the future as a result of their Tech Prep experience.

b. Tech Prep teachers agree that students' attitudes toward school and learning have improved over the first pilot test year.

c. In general, a great deal of change was not observed in the Tech Prep groups when compared to control groups. This finding was expected due to the sensitivity of instruments to measure change over such a short time period. However, Career maturity and attitude toward technological careers was significantly increased in one of the sites and Grade point average was significantly greater at another site. Negative consequences were observed in two sites. Grade point average at one site and attitude toward school and attitude toward teachers at another site were observed to be lower for Tech Prep students than the control group students. These findings should be taken with great caution. Results a year later will be much more meaningful.

Key Question 10. What features of the prototypes facilitate replication?

a. Although political and situational uniquenesses of schools will determine effective replication, many aspects of the pilot programs can be replicated by other schools including: 1) curriculum materials and practical application examples, 2) staff development procedures, and 3) planning, implementation and management strategies.

Key Question 11. What are the barriers to implementing Tech Prep?

a.Lead time has been a problem in effectively designing and implementing Tech Prep. It is unrealistic to expect schools to effectively implement Tech Prep without sufficient lead time.

b.To date, there has been a limited amount of leadership and technical assistance provided by the Department of Education Staff (with the exception of providing funding and related service). This has allowed for uninhibited, creative development of the prototypes but it has also resulted in some frustration at the local level.

c.Adding outside teachers (hiring new teachers to teach Tech Prep) is not viewed as advantageous to implementation.

d.The coordination and communication responsibilities of Tech Prep managers in multiple school settings (Columbus and Bloomington) are greater than that placed on other sites.

e. The lack of direct, face-to-face dialogue between Department of Education and site staff has been inefficient.

f. A precise operational definition of Tech Prep is lacking.

Key Question 12. What resources are necessary to implementing the prototypes in other settings?

a.Staff development is a critical element for the effective implementation of Tech Prep. Specific needs have surfaced in the areas of curriculum development and/or adaptation and teaching strategies using applied methods, cooperative learning, learning styles, and subject matter integration.

b.Success of Tech Prep is heavily dependent on the faculty who have been selected and involved. The teachers' creativity, pedagogical skills, commitment, and willingness to work beyond the normal call of duty are critical elements.

c.School principals and other instructional leaders have not been intensively involved in the implementation of Tech Prep. Their leadership and involvement is viewed as crucial to widespread integration and long-term success.

d.Opportunities for statewide in-service and sharing sessions (like the one at Brown County) are viewed as useful and valued activities by most all involved.

e.With the nearing of implementation deadlines, school personnel are needing more and more information and suggestions for action. This need is beginning to impose a burden on pilot site managers and staff.

f.Although a certain amount of equipment is necessary to implement the Tech Prep concept, the amount is overstated and overestimated by most people.

Suggestions

1. Define Tech Prep in precise, operational terms and provide parameters for the design and delivery of Tech Prep to include more specific selection and recruitment criteria for students.

2. Improve understanding of Tech Prep by communicating better with students, teachers, counselors, administrators and community people.

3. Package and market Tech Prep as a strategy of instruction rather than as a stand alone, equipment project.

4.. Provide staff development opportunities for Tech Prep teachers regarding performance based curriculum development/adaptation and new teaching strategies.

5. On a state level basis, develop and package instructional applications that can be selected and implemented by Tech Prep teachers.

6. Provide opportunities for Tech Prep teachers to share ideas and experiences through periodic regional and statewide meetings.

7. Encourage and facilitate the use of committees in the planning, designing and implementing of Tech Prep within school corporations.

8. Provide technical assistance to school personnel in selecting equipment and set-up of equipment and labs.

9. Establish a list of essential resources and equipment needed for the implementation of Tech Prep.

10. Establish the current pilot sites as demonstration centers and provide resources for assisting other school corporations in the implementation of Tech Prep.

11.Establish policies for bringing together secondary and post secondary faculty and policies.

12. Pursue additional evaluation activities during year two to include: testing for student gains in problem solving, critical thinking and teamwork skills, and other socio-technical skills.

13. Develop a plan for initiating and implementing Tech Prep at the school level. Involve Tech Prep Managers in this planning.

14. Initiate action to ensure that post secondary curricula is reformed to match the gains achieved in secondary Tech Prep.

15. Consider beginning Tech Prep earlier in the curriculum. (before 11th grade).

16. Provide Tech Prep core courses at all schools but consider pooling resources to provide regional delivery of more expensive advanced occupational components.

Appendix

Tech Prep Feedback Form

Tech Prep is a legislatively mandated initiative of the Indiana Department of Education. It is an effort to help students in the general education curriculum be prepared to deal with technological careers by preparing them for higher education or work in an area of technology. This form is designed to gain your reaction to the Tech Prep concept that is being tested in the State. Please respond candidly and return this form immediately.

1. **What is your current position?**

___ Academic instructor ___ Occupational/career Instructor
___ Counselor ___ Administrator
___ Admissions Officer ___ Other _____

2. **Please indicate your opinion regarding the desirability of the following Tech Prep Program Elements:**

	Not good			Very good
a. The use of real life application in teaching	1	2	3	4
b. The use of precise student performance standards	1	2	3	4
c. The integration of subject matter across courses (math, science, communications, technology)	1	2	3	4
d. The articulation of secondary programs with 2 and 4 yr post secondary technology programs	1	2	3	4
e. The focus on those in the general education curriculum	1	2	3	4

Please indicate your level of agreement with the following statements:

	Strongly Disagree			Strongly Agree
3. Tech Prep will make our post secondary programs more efficient	1	2	3	4
4. Tech Prep concepts, cited above, should be incorporated into our post secondary curriculum	1	2	3	4
5. Tech Prep is just another short lived innovation	1	2	3	4
6. I am reasonably well informed about Tech Prep	1	2	3	4
7. I would like to know more about Tech Prep	1	2	3	4
8. I would like to be more involved with Tech Prep	1	2	3	4
9. Tech Prep should help us in recruiting students	1	2	3	4
10. Tech prep should eliminate some of our need for remedial instruction	1	2	3	4

11. **What are the positive aspects and potential effects you see for Tech Prep?**

12. **What are the negative aspects or problems you see for Tech Prep?**

13. **What suggestions do you have for enhancing the impact of Tech Prep?**

14. **What will your institution need to do to facilitate Tech Prep?**

Tech Prep Feedback Form

Tech Prep is a legislatively mandated initiative of the Indiana Department of Education. It is an effort to help students in the general education curriculum be prepared to deal with technological careers by preparing them for higher education or work in an area of technology. This form is designed to gain your reaction to a Tech Prep Pilot Project that is being tested in your school. Please respond candidly and return this form immediately.

1. What is your current position?

___ Academic instructor ___ Vocational Instructor ___ Counselor
___ Administrator ___ Other_____

2. Please indicate your opinion regarding the desirability of the following Tech Prep Program elements:

	Not good			Very good
a. The use of real life application in teaching	1	2	3	4
b. The use of precise student performance standards	1	2	3	4
c. The integration of subject matter across courses (math, science, communications, technology)	1	2	3	4
d. The articulation of secondary programs with 2 and 4 yr post secondary technology programs	1	2	3	4
e. The focus on those in the general education curriculum	1	2	3	4

Please indicate your level of agreement with the following statements:

	Strongly Disagree			Strongly Agree
3. Tech Prep shows great promise for many students in our school	1	2	3	4
4. Tech Prep should be a separate program for some students	1	2	3	4
5. Tech Prep concepts should be incorporated into our entire curriculum	1	2	3	4
6. Tech Prep is just another short lived innovation	1	2	3	4
7. Tech Prep will help motivate many students	1	2	3	4
8. I am concerned that Tech Prep will take my students	1	2	3	4
9. I am reasonably well informed about Tech Prep	1	2	3	4
10. I would like to know more about Tech Prep	1	2	3	4
11. I would like to be more involved with Tech Prep	1	2	3	4

12. What are the positive aspects and potential effects you see for Tech Prep?

13. What are the negative aspects and potential effects you see for Tech Prep?

14. What suggestions do you have for enhancing the impact of Tech Prep within your school?

Tech Prep Feedback Form

Tech Prep is a legislatively mandated initiative of the Indiana Department of Education. It's purpose is to help high school age students prepare themselves for advancement within the technologically oriented workforce. Tech Prep is closely linked with IVY Tech Centers and Universities to make it efficient for students to continue their education if desired. A school in your area is currently involved in pilot testing Tech Prep. Please provide your reactions and opinions on this form and return it immediately. Thank you for your assistance.

1. **Have you heard about Tech Prep?** ___ Yes ___ No

2. **Do you think there is a need for a program such as Tech Prep?** ___ Yes ___ No

3. **What benefits would such a program have to your business and the community?**

4. **What types of involvement do you think business people should have in a Tech Prep Program?**

___ Serving on advisory committees/councils
___ Providing sites for student field trips
___ Providing speakers for classes
___ Initiating student outreach activities
___ Sharing business site facilities and equipment
___ Making donations of staff time
___ Making donations of equipment and materials
___ Making donantions of money for program needs
___ Other (please specify) _____
___ Other (please specify) _____

5. **What suggestions do you have for keeping Tech Prep instruction current?**

6. **Would you like to know more about Tech Prep?** ___ Yes ___ No

7. **How have you been involved in Tech Prep?**

8. **Would you like to be more involved with Tech Prep?** ___ Yes ___ No

Name _____

STUDENT REACTION FORM

DIRECTIONS

Please provide your reaction to the following statements by circling one of the following choices.

SD = Strongly Disagree

D = Disagree

N = No Opinion

A = Agree

SA = Strongly Agree

1.	Most of my teachers are good ones.	SD	D	N	A	SA
2.	There is nothing in school for me.	SD	D	N	A	SA
3.	My high school emphasizes college too much.	SD	D	N	A	SA
4.	I am learning a lot this year.	SD	D	N	A	SA
5.	I would like to attend a college or university after graduating from high school.	SD	D	N	A	SA
6.	Class periods should be shorter.	SD	D	N	A	SA
7.	Learning math seems easier to me this year than last.	SD	D	N	A	SA
8.	I like school.	SD	D	N	A	SA
9.	Most courses in school are worthwhile.	SD	D	N	A	SA
10.	Teachers seldom listen to students.	SD	D	N	A	SA
11.	Most school courses are too easy.	SD	D	N	A	SA
12.	I am really interested in studying English/communications this year.	SD	D	N	A	SA
13.	Students need more freedom in arranging classes.	SD	D	N	A	SA
14.	Learning science seems easier this year than last.	SD	D	N	A	SA
15.	I respect most of my teachers.	SD	D	N	A	SA
16.	Most of my classmates aren't interested in school.	SD	D	N	A	SA
17.	I am more interested in studying science this year than last year.	SD	D	N	A	SA

18. Everyone should graduate from high school.	SD	D	N	A	SA
19. Equipment used in my classrooms helps me learn.	SD	D	N	A	SA
20. Students need more counseling.	SD	D	N	A	SA
21. School is boring.	SD	D	N	A	SA
22. I am more interested in math this year than I was last year.	SD	D	N	A	SA
23. Further education beyond high school is important.	SD	D	N	A	SA
24. I would like to attend an IVY Tech school after graduating from high school.	SD	D	N	A	SA
25. Studying English/communications is easier for me than it used to be.	SD	D	N	A	SA
26. There needs to be more contact between teachers and students.	SD	D	N	A	SA
27. I like the way I am being taught this year.	SD	D	N	A	SA
28. Most of my teachers help me learn.	SD	D	N	A	SA
29. The way my classrooms are arranged makes it difficult to learn.	SD	D	N	A	SA
30. My high school expects too much from students.	SD	D	N	A	SA
31. It is important to our country to have people who know about technology.	SD	D	N	A	SA
32. A student must be good in math and science to study technology.	SD	D	N	A	SA
33. Learning about technology will help in getting any kind of job.	SD	D	N	A	SA
34. I think people would be far better off without all this technology.	SD	D	N	A	SA
35. A student has to be very smart to study technology.	SD	D	N	A	SA
36. High school graduates need to understand technology to get a good job.	SD	D	N	A	SA
37. Technology is unnecessary and wastes our resources.	SD	D	N	A	SA
38. Students preparing to go to work after high school need to learn about technology.	SD	D	N	A	SA
39. Understanding technology is important to getting promoted on the job.	SD	D	N	A	SA
40. Technology makes our lives healthier, easier, and more comfortable.	SD	D	N	A	SA
41. Students preparing to go to college after high school need to learn about technology.	SD	D	N	A	SA
42. I am very interested in a career in technology.	SD	D	N	A	SA
43. Technology creates more problems than it solves.	SD	D	N	A	SA
44. High school students need to learn about technology to become better citizens.	SD	D	N	A	SA

45. I will never get a job in technology.	SD	D	N	A	SA
46. Technology makes life too complicated.	SD	D	N	A	SA
47. Being an informed consumer requires knowledge of technology.	SD	D	N	A	SA
48. You have to have college training for most jobs in technology.	SD	D	N	A	SA
49. People are too dependent on technology.	SD	D	N	A	SA
50. I would like to learn about technology in school.	SD	D	N	A	SA
51. Jobs in technology are boring.	SD	D	N	A	SA
52. Technology is largely responsible for our standard of living in the United States.	SD	D	N	A	SA
53. Learning about technology is important to my education.	SD	D	N	A	SA
54. Career opportunities in technology will be expanding in the future.	SD	D	N	A	SA
55. Technology can help solve societal problems like pollution and overpopulation.	SD	D	N	A	SA
56. The average student would gain very little from learning about technology.	SD	D	N	A	SA
57. Chances for future employment are great in technological careers.	SD	D	N	A	SA
58. Most jobs of the future will require knowledge of technology.	SD	D	N	A	SA

Screening Form A-2

Attitude Scale

John O. Crites, Ph.D.

CAREER MATURITY INVENTORY

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